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EUB Alberta Energy and Utilities Board

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Directive 065

(formerly Guide 65)

November 30, 2004 incorporating Revision 1, December 14, 2004 (Appendix H)

Resources Applications for Conventional Oil and Gas Reservoirs

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How to Use This Directive

Directive 065 simplifies the process to apply to the Alberta Energy and Utilities Board (EUB) for all necessary approvals to establish the strategy and plan to deplete a pool or portion of a pool using one resource application. Previously, the requirements were mainly found in Part 15 of the *Oil and Gas Conservation Regulations*.

This directive also enables you to review in a single document the application requirements and the explanations for those requirements for most conventional oil and gas reservoir topics considered in an application for EUB approval. The EUB will conduct periodic reviews of this directive's continued usefulness for applicants and conduct updates based on feedback received (see Appendix G) and re-engineering reviews.

As identified in *Bulletin 2004-30*, this directive becomes effective December 6, 2004.

Introduction

Specific resource applications are required to allow the EUB and potentially affected parties, often with competing interests, to understand and test the appropriateness or impact of depletion plans at critical milestones. Other resource applications may address revisions to the baseline set of depletion or equity rules and reservoir descriptions. Finally, some resource applications address known equity disputes arising from different ownership, limited opportunity to produce, or access constraints to established facilities. If such issues are not resolved, these applications go directly to a hearing.

The EUB reviews all resource applications to ensure that the appropriate level of reservoir engineering and geological science is applied in managing poolwide depletion and that potential impacts on other stakeholders are identified and dealt with fairly. Because individual reservoirs are unique, detailed assessments may be necessary to ensure that the depletion plan is appropriate and recovery is in the public interest. You must provide sufficient up-front information and analysis to support the reasonableness of your proposals.

The EUB has compiled this comprehensive directive to support a level playing field for all applicants. Applicants are expected to know and understand requirements and file accurate and complete applications. EUB staff will not complete missing application requirements, such as raw data collection and supporting analytical discussion. Instead, EUB staff will test assumptions, check completeness and accuracy of data and assessments, and test alternatives.

What This Directive Contains

This directive includes Schedule 1: Resources Applications registration form, guidelines on notification requirements, and five units that address detailed information requirements for 21 specific regulatory topics, as well as appendices giving reference sources and other support information.

The resources applications for which this directive applies are divided into units as follows:

1) **Equity**: rateable take, common purchaser, common carrier, common processor, compulsory pooling, and special spacing

2) **Conservation**: enhanced recovery scheme (gas cycling, waterflood, immiscible gas flood, miscible flood), concurrent production, and pool delineation and ultimate reserves

3) **Production Control**: commingled production, good production practice (primary depletion pools), gas-oil ratio penalty relief, special maximum rate limitation, and gas allowable

4) **Disposal/Storage**: disposal (water and waste), acid gas disposal, and underground gas storage

5) **Corporate Changes**: change in name of the holder of an EUB approval and change in holder of an EUB approval

The appendices include
- list of references
- example of nonobjection letter
- Application for Gas-Oil Ratio Penalty Relief (Form O-33)
- Transfer of Approval form
- list of EUB contacts
- *Interim Directive 2000 –5: Guide 65*
- feedback form
- commingling of production
- Enhanced Recovery Scheme application form

You are strongly encouraged to become familiar with the references listed in Appendix A before completing your applications.

Procedure for Reviewing Application

Figure 1 shows the overall oil and gas resources applications process, and Figure 2 shows the oil and gas resources applications evaluation process.

Step 1: Application Registration

You must submit three copies of the application package, including Schedule 1, unless otherwise specified in individual units of this directive. For data retention purposes, please provide Schedule 1 printed on one side only. Send the application to the Alberta Energy and Utilities Board, Resources Applications Group, 640 – 5 Avenue SW, Calgary, Alberta T2P 3G4. If the application proceeds to a hearing or is otherwise complex, you may be asked to provide as many as 19 additional copies. Applicants are referred to the EUB's *Rules of Practice* for additional information.

The EUB assigns each application package a unique application number. Applicants are encouraged to confirm the registration of their application by checking the Integrated Application Registry (IAR), accessible from the Applications page on the EUB's Web site www.eub.gov.ab.ca.

Note that all data must be submitted using metric units (SI).

Step 2: Corporate Record Check

All applications are subject to a corporate check to verify acceptable performance records and other information in EUB files.

Applicants seeking formal approval must hold a valid company code issued by the EUB's Corporate Compliance Group. If you are a first-time applicant, you must obtain a company code by filing a corporate profile with the EUB's Corporate Compliance Group. Information packages are available from the Corporate Compliance Group at (403) 297-8320. You must update your corporate profile when asked to do so by the EUB.

EUB approvals identify the applicant as the holder of the approval, and this party is responsible and accountable for compliance with all regulations and the approval conditions. Applicants requesting changes to a general order of the EUB, reservoir description, and operational practices not requiring a change to an approval do not need to have a company code but must have a valid interest in the pool.

If you are on "refer" status due to an unresolved serious noncompliance problem, the EUB may ask additional questions, including questions related to corporate accountability, technical competency, and corporate commitment to compliance with provincial standards, as part of the EUB enforcement policy detailed in *Informational Letter*
(IL) 99-4: EUB Enforcement Process. In the case of a "refer" status, EUB Board members are directly involved in the consideration of any application, which may include a decision to go to a hearing. Otherwise, the application is normally reviewed and, if appropriate, approved by the delegated work groups within the EUB.

Step 3: Application Returned or Delayed if Incomplete

Effective October 1, 2000, the EUB will no longer process an application identified in this directive if it is substantially incomplete (i.e., has a major deficiency). It will be returned to you with an explanation. An example of such a major deficiency is the complete omission of an entire key information segment of any unit requirements, such as the geological description. If the application has minor deficiencies, such as lacking specific information needed to make a decision, you will be provided with a clear explanation and given 5 working days to respond. Failure to respond in this time frame will result in the EUB closing and returning your application with written notification of the reason. The EUB is prepared to correct small errors in the submitted information, as long as applicants show improvement in submitting better-quality applications.

Note that if the EUB returns a severely deficient and incomplete application that you filed in response to an EUB request, such as for improvement in recovery or operational performance, you will be subject to any consequences or penalties previously identified at the time of the request.

Step 4: Application Evaluation

This directive identifies some circumstances that may reduce application requirements and, in turn, result in a faster decision on the application. You may want to consider the long-term benefits of creating some of these circumstances, such as equity agreements and poolwide plans, before you file a competitive, partial pool application.

The evaluation of your application may also be expedited if your definition of the pool extent is consistent with the EUB's pool designation or you provide a discussion on any variances. Resolving significant differences, such as pool delineation, once the application is filed could add considerable time to the application process and raise issues that are better dealt with beforehand.

When evaluating an application, the EUB reviews a pool's unique features, if any, to assess whether additional information, analysis, or consultation beyond what is identified in the directive is required. As explained in the Resources Applications Notification Guidelines and individual units of this guide, in those cases where the applicant has chosen to conduct notification the EUB will require submission of documentation describing your notification program. The EUB will review this evidence, especially the written notice or other correspondence, showing that you have contacted all potentially affected parties and provided them with a fair opportunity to learn about your planned application and to submit their views to you and the EUB. Signed letters of nonobjection are preferred in this regard, but the EUB will also consider other evidence and explanations of your efforts to address notification within a reasonable time period.

Objections/Dispute Resolution

The EUB expects applicants to conscientiously address all relevant concerns raised by potentially adversely affected parties. Should disputes arise, the EUB expects the parties to discuss the issues and options for resolution, including the use of third-party mediators. EUB staff, if requested, can assist in explaining EUB rules and in facilitation.

If you conclude that further discussion is unlikely to resolve issues, you should inform the EUB, outlining concerns, steps you have taken to resolve problems, and your recommended course of action. Note that outstanding objections can result in an EUB hearing. Should a hearing be called, both you and the intervener might be asked to file additional substantiating evidence. Matters of confidentiality and disclosure should be addressed and determined by the parties prior to submission of the evidence.

Documented Decisions/Surveillance

EUB decisions on the resource applications listed in this directive are issued in written format and generally include a letter and either a formal site-specific approval or a regional or provincial order.

The decisions often include clear descriptions of key or scheme-specific regulatory requirements that will be a focus of EUB surveillance. Holders of approvals are reminded to file timely applications to change any requirements. The application process links directly to the surveillance process by which the EUB conducts follow-up checks on conditions, monitors well/pool performance and compliance with regulations, and takes enforcement actions as required.

Figure 1. Resources applications process

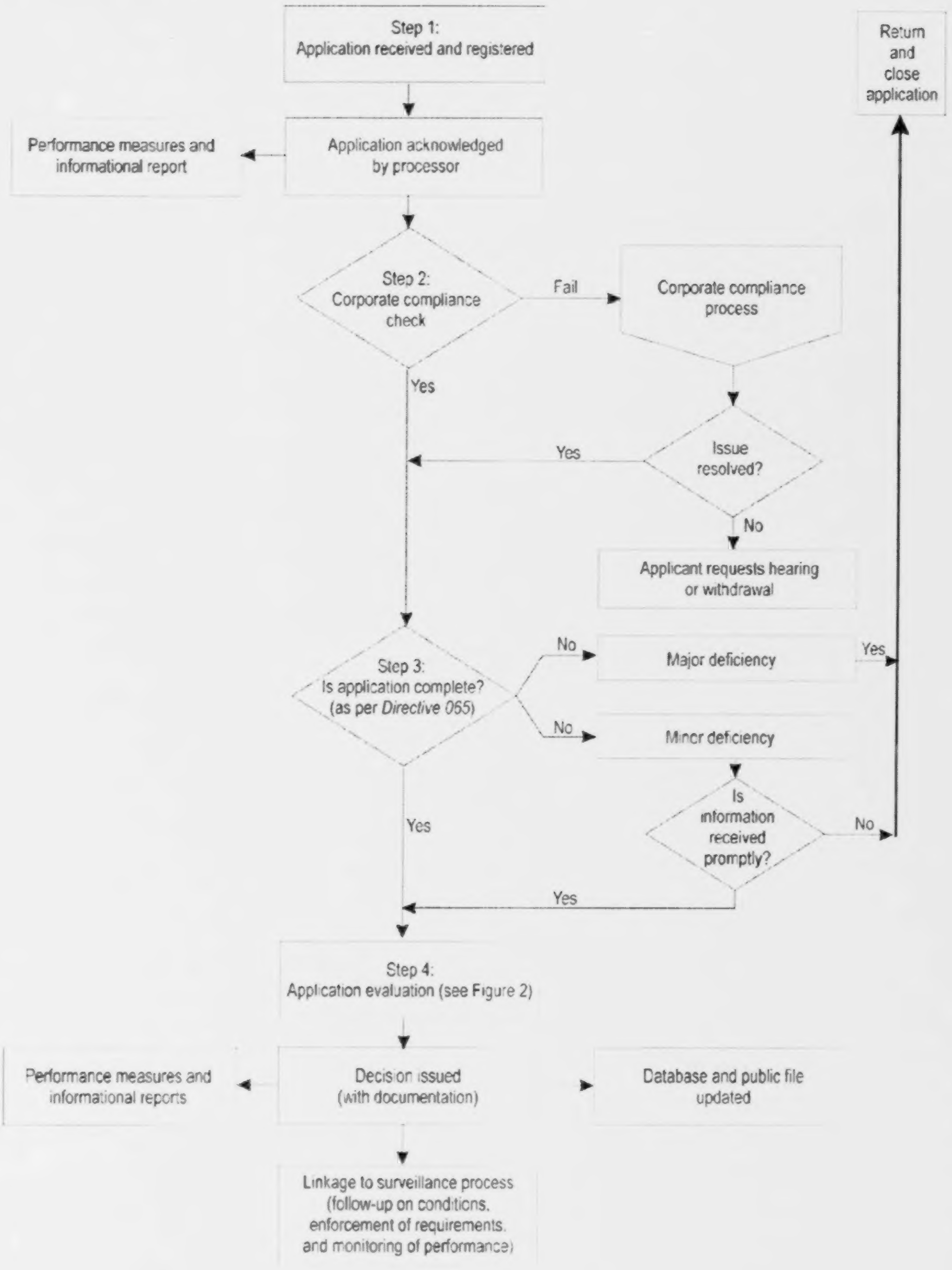
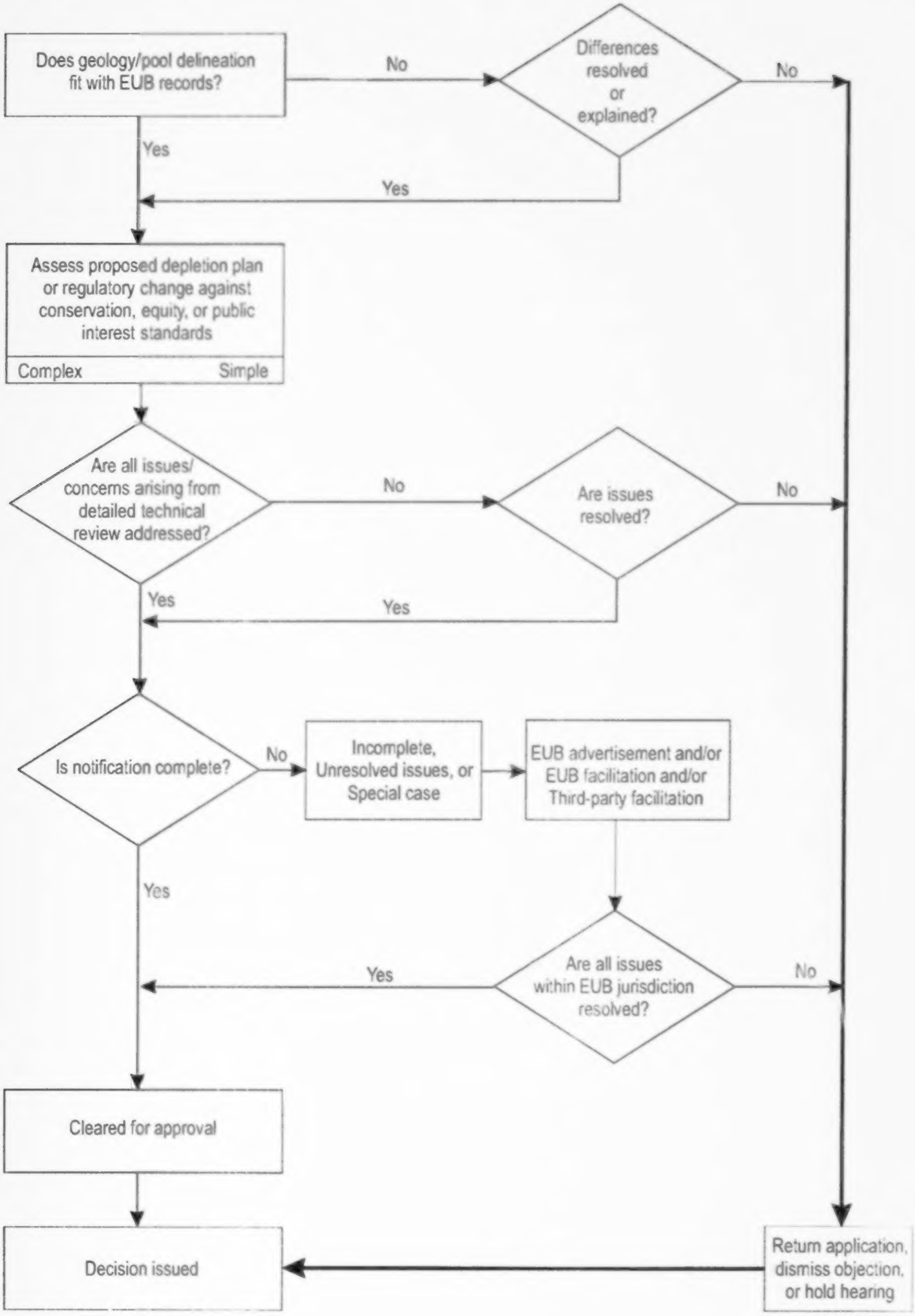

Step 1:
Application received and registered
Return and close application
Performance measures and informational report
Application acknowledged by processor
Step 2: Corporate compliance check
Fail
Corporate compliance process
Yes
Yes
Issue resolved?
No
Applicant requests hearing or withdrawal
No
Major deficiency
Yes
Step 3: Is application complete? (as per Directive 065)
No
Minor deficiency
Is information received promptly?
No
Yes
Yes
Step 4: Application evaluation (see Figure 2)
Performance measures and informational reports
Decision issued (with documentation)
Database and public file updated
Linkage to surveillance process (follow-up on conditions, enforcement of requirements, and monitoring of performance)

Figure 2. Resources applications evaluation



Does geology/pool delineation fit with EUB records?
No
Differences resolved or explained?
No
Yes
Yes
Assess proposed depletion plan or regulatory change against conservation, equity, or public interest standards
Complex
Simple
Are all issues/ concerns arising from detailed technical review addressed?
No
Are issues resolved?
No
Yes
Yes
Is notification complete?
No
Incomplete, Unresolved issues, or Special case
EUB advertisement and/or EUB facilitation and/or Third-party facilitation
Yes
Are all issues within EUB jurisdiction resolved?
Yes
No
Cleared for approval
Decision issued
Return application, dismiss objection, or hold hearing

EUB Alberta Energy and Utilities Board

Directive 065 – Schedule 1
Resources Applications

1. REGISTRATION

Month ___ Day ___ Year ___

Applicant's File Number ____________________

EUB USE ONLY

Registration Number: ____________________

Registration Date: Month ___ Day ___ Year ___

Company Name ____________________

Company Code ____________________

Contact Person (N/A ☐) ____________________ ____________________

Last Name First Name

Telephone ____________________

Fax ____________________

E-mail Address ____________________

Consultant (N/A ☐) ____________________ ____________________

Company Name Consultant Code

Consultant Contact Person ____________________ ____________________

Last Name First Name

Telephone ____________________

Fax ____________________

E-mail Address ____________________

2. BASIC INFORMATION REQUIREMENTS

1. Field, Strike Area, and Pool

Field Code No./Name	Strike Area Name	Pool Code No./Name

2. What is the ownership basis on which you make this application?

____

____

3. Have you completed the notification requirements? Yes ☐ No ☐

4a. Do you need EUB assistance to complete the notification requirements? Yes ☐ No ☐ If Yes, please supply details

____

____

4b. Are there outstanding concerns? Yes ☐ No ☐

____

____

5. Does your injectant contain hydrogen sulphide (H_2S)? Yes ☐ No ☐

5a. If Yes, is a new emergency response plan (ERP) needed, or does an existing ERP need updating? Yes ☐ No ☐

5b. If No, state why not ____________________

____

5c. If Yes, supply details ____________________

(continued on next page)

Company Name ______________________

5d. Have you conducted notification for ERP purposes to all potentially affected parties? Yes ☐ No ☐

5e. If Yes, are there any outstanding concerns?

____

____

6. Are you applying to amend an existing approval or order? Yes ☐ No ☐

____

____

6a. If Yes, what is the existing approval or order number? ______________________

6b. Is the name of the approval holder current? Yes ☐ No ☐

3. TYPES OF APPLICATIONS:

1. What types of resources applications are you submitting at this time?

UNIT 1 - EQUITY

☐ Rateable Take (1.1)
☐ Common Purchaser (1.2)
☐ Common Carrier (1.3)
☐ Common Processor (1.4)
☐ Common Pooling (1.5)
☐ Special Spacing (1.6)

UNIT 2 - CONSERVATION

☐ Enhanced Recovery Scheme (2.1)
☐ Concurrent Production (2.4)
☐ Pool Delineation and Ultimate Reserves (2.5)

UNIT 3 - PRODUCTION CONTROL

☐ Commingled Production (3.1)
☐ Good Production Practice (Primary Depletion Pool) (3.2.2)
☐ Gas-Oil Ratio Penalty Relief (3.2.3)
☐ Special Maximum Rate Limitation (3.2.4)
☐ Gas Allowable (3.3)

UNIT 4 - DISPOSAL/STORAGE

☐ Disposal (Class I-IV) (4.1)
☐ Acid Gas Disposal (4.2)
☐ Underground Gas Storage (4.3)

UNIT 5 - CORPORATE CHALLENGES

☐ Change in Name of Approval Holder (5.1)
☐ Change of Holder of Approval (5.2)

4. FUTURE APPLICATIONS:

1. Do you plan to submit subsequent applications associated with the present applications to the EUB within six months?
   Yes ☐ No ☐
2. If Yes, state what types and when you plan to submit these applications.

____

____

____

Note: Remember to file three copies of the application package, including Schedule 1, unless otherwise specified in individual units of this guide.

SUBMIT APPLICATIONS TO:

Alberta Energy and Utilities Board
Resources Applications Group
640- 5 Avenue SW
Calgary, Alberta T2P 3G4

Schedule 1 Guide

When to Use Schedule 1	Schedule 1 is required for all applications contained in *Directive 065*. It provides registration information, along with the identification of application type and key items that should be addressed prior to proceeding with the resources applications.

Part 1: Registration

Date	In the upper left-hand corner, enter the date on which you will submit this application to the EUB.
Applicant's File Number (Optional)	Enter your own file number, if desired, in the upper right-hand corner.
Company Name	Enter your company name. As applicant, your company is legally responsible for the accuracy and completeness of this application and all supporting technical information. Upon approval, the company becomes the approval holder or is subject to the conditions set out in an EUB order, such as the Monthly MRL Order, and bears the responsibility for implementation, operations, and compliance.
Company Code	Enter your assigned four-digit company code. If no code has been assigned, contact the EUB Corporate Compliance Group to obtain your code before submitting any application.
Contact Person	Enter the name (last name first) of the person authorized by your company to be responsible for this application and to act on your company's behalf. If a consultant is acting on the company's behalf, check N/A. The EUB will consider the action and decisions of this individual to be the actions and decisions of your company. Any EUB approval, permit, or order resulting from this application will be issued in the company's name and sent to the contact person.
Telephone/Fax	Enter the business telephone number and facsimile number of the contact person, including area code.
E-mail Address	Enter the e-mail address of the contact person, if available.

Consultant	Enter the company name of the consultant submitting an application on the company's behalf. If a consultant is not being used, check N/A. A consultant is a person or corporation retained by the applicant to prepare the application. The EUB considers the applicant to be legally responsible for the accuracy and completeness of the application even when it is submitted on the applicant's behalf by the consultant.
Consultant Code	Enter the consultant's four-digit code. If no code has been assigned, contact the EUB Corporate Compliance Group. (The EUB does not keep corporate compliance records for consultants unless they are licensee/permit/approval holders.)
Consultant Contact Person	Enter the name of the person at the consulting company responsible for preparing this application. The EUB will direct correspondence and questions about the application to this person. Any EUB approval, order, or letter of approval resulting from this application will be issued in the applicant's name and mailed to the consultant's contact person.
Telephone/Fax	Enter the business telephone number and facsimile number of the consultant's contact person, including area code. This person must ensure that the applicant receives a copy of the approval, order, or letter of approval.
E-mail Address	Enter the e-mail address of the contact person, if available.

Part 2: Basic Information Requirements

1. Field, Strike Area, and Pool Code Numbers and Names	Enter the assigned four-digit field code and the seven-digit pool code (as applicable) and the field, strike, and pool names that are assigned by the EUB. You may obtain your field and pool code from *Guide 43*.
2. What is the ownership basis on which you make this application?	State your qualification as an applicant, specifying business links and relationship to other owners in the area of application. Those qualified to make an application include a recognized representative who has direct interest in the proposed application type or is an affected party (e.g., a unit operator, holder of an approval, well licensee, lessee, or lessor of undrilled land).

3. Have you completed the notification requirements?

Check **Yes** if you have met the notification requirements outlined in the Resources Applications Notification Guidelines, Tables 1 and 2, and in the individual units of this guide. Please submit documentation describing your notification program.

Check **No** if you have not completed these requirements and provide an explanation as to why not.

Each unit in *Directive 065* describes the minimum notification requirements for a particular application. These are all summarized in Tables 1 and 2. As a minimum, you must complete the notification requirements in Table 1 prior to filing certain types of applications. For the application types listed in Table 2, you are strongly encouraged to complete notification prior to filing your application.

You must also consider whether unique situations exist that warrant additional notice. When the EUB reviews your application, it will also assess any unusual aspects that might increase notification requirements. The EUB also may serve formal notification where the project scope or location requires additional steps to ensure compliance with Section 29 of the Energy Resources Conservation Act (ERCA).

4a. Do you need EUB assistance to complete the notification requirements?

Check **Yes** if you do require EUB assistance. If not, check **No**.

The EUB may serve formal notification for resources applications where applicants are unable to initiate contact or complete notification in accordance with Section 29 of the ERCA. You must, however, provide complete lists of potentially adversely affected parties and their addresses, as detailed in Tables 1 and 2 of the Resources Applications Notification Guidelines. You might opt to have the EUB conduct the notification where the scope or number of parties is large. This does not remove the need for you to conduct meaningful consultation with any party identifying concerns. You will assume advertisement costs and can expect process delays of up to three or four weeks if the EUB conducts notification.

4b. Are there outstanding concerns?

If you answer **Yes** to the question of outstanding concerns or objections, you must include a detailed explanation of the concerns, a summary of your efforts to resolve the problem, and the alternatives reviewed.

5. Does your injectant contain hydrogen sulphide (H_2S)?

Check the appropriate box.

5a. If Yes, is a new ERP needed or does an existing ERP need updating?	If H_2S is being injected, an emergency response plan (ERP) may be required by the EUB's Operations Group before injection commences. If a new ERP or updated ERP has already been approved, you should provide the details.
5b. If No, state why not.	
5c. If Yes, supply details.	
5d. Have you conducted notification for ERP purposes to all potentially adversely affected parties?	Check the appropriate box.
5e. If Yes, are there any outstanding concerns?	
6. Are you applying to amend an existing approval or order?	Check the appropriate box. This applies only to changes to an existing approval or order that has been issued in a company's name.
6a. If Yes, what is the existing approval or order number?	If **Yes**, enter the number of the existing approval (four digits) or order (five digits) that the application applies to.
6b. Is the name of the approval holder current?	Check the appropriate box. If **No**, review Unit 5 and Appendix D in this guide. Appendix D is a transfer of approval form, which you may complete and submit with your application.

Part 3: Types of Applications

1. What types of resources applications are you submitting at this time?	Check the boxes under Units 1-5 for the related types of applications that you are submitting for EUB review and approval. For example, a spacing and an enhanced recovery scheme application to account for the desired injection pattern may be submitted as one package. Review the individual unit sections cited in Schedule 1 to determine the information requirements and any technical reports that you must provide to support each application.

Part 4: Future Applications

1. Do you plan to submit subsequent applications associated with the present applications to the EUB within six months?	Check the appropriate box. The EUB uses this information for coordinating internal business practices, and it may assist the EUB in understanding the pool depletion strategy.
2. If Yes, state what types and when you plan to submit these applications.	

Resources Applications Notification Guidelines

These guidelines present the minimum notification requirements for specific types of resources applications. Following them, you have the opportunity to complete notification and associated consultation, if needed, prior to filing your applications. Almost all notifications are between knowledgeable business groups, serving to simplify the explanations needed.

Should the parties notified raise issues, you must be prepared to respond, including holding personal consultations if requested. If you know there will be contentious or complex issues, personal consultation may be preferable as a first step rather than notification; however, it is not required. When contact with the public is required, you should provide a copy of your application and offer to hold discussions and consultations on any issue identified. (See EUB *Guide 56* and *IL 89-4* for more information on public consultation.)

Summary of Requirements

Tables 1 and 2 are summaries of the notification requirements for most application types covered by this directive. A glossary of relevant terms follows the tables. Each unit includes detailed discussions of notification requirements.

For the resources applications listed in Table 1, you must conduct notification prior to filing your application and either provide evidence confirming that there are no objections or concerns with your application or specific details regarding the objections or concerns. In order to promote the early implementation of enhanced recovery (ER) schemes through a timely and complete review of applications focused on optimizing hydrocarbon recovery and better serving the public interest, notification must be completed prior to the submission of ER scheme applications. Concurrent production requires poolwide concurrence before gas-cap gas is produced. Minimum notification requirements for waste and acid gas disposal are also given in Table 1. Because applications for rateable take, for common carrier, purchaser and processor, and for compulsory pooling are being filed because of unresolved differences, you must include documentation demonstrating that you have made all reasonable consultation efforts to try to resolve the differences in your application.

If you are unable to complete notification prior to making an application for enhanced oil recovery (EOR), gas cycling, concurrent production, acid gas disposal, or waste disposal, include reasons why. The EUB will review the circumstances to see if an exception to the notification requirements is warranted.

For the remaining resources applications listed in Table 2, the EUB prefers and encourages you to complete notification prior to filing your application and provide evidence confirming that there are no objections or concerns to the applications. If this is not done, you must provide the EUB with a list of potentially adversely affected parties and the EUB will conduct its own notification following its review of the application. Note that in such cases you will be responsible for the advertisement costs and you can expect the approval process to take an additional three to four weeks.

In many pools, operators implement a poolwide scheme or coordinate a depletion strategy under common ownership or agreements. The EUB acknowledges that this is not feasible in all situations. Where pool configuration or strategy permits, the EUB accepts applications for competitive operations covering only a portion of a pool. For a new EOR scheme, you must notify all licensees of wells completed in the pool that are within the applied-for approval area and within a quarter section of the applied-for approval area to allow for input on the potential impact and acceptance of the strategy. For a new gas cycling scheme, all well licensees that are within a section of the applied-for approval area must be notified. Industry exchange in these circumstances may result in identifying alternative strategies or reservoir differences requiring further assessment. It also promotes future compatible and coordinated operations.

Often you will obtain resource application approval of an optimum strategy before you can finalize plans or design details and proceed with implementation applications, including those addressed in *Guide 56: Energy Development Application Guide*. The resources applications for spacing and sour gas injection proposals, through their updated emergency response plan (ERP), and waste disposal have a public landowner or occupant notification requirement. As a general rule, all other resources applications in this directive are not expected to have direct local public impact. Public issues are usually considered in subsequent surface development applications. However, whenever you are discussing plans with members of the public, you are encouraged to address all elements of a project to the extent possible. This allows the public to better understand the full picture, which can lead to more meaningful exchange.

How to Conduct Notification

To conduct the notification, you must inform all potentially adversely affected parties of the details of your application and address all of their issues. You must provide documented evidence of the results and a description of your notification program for your application if required.

A signed letter of nonobjection is the preferred documented evidence. Alternatively, you must provide a copy of the correspondence and notice, which includes a clear description of the application or an attached copy of the application. You must give a reasonable time to respond (a minimum of 15 days) and specific instructions as to how to register questions or concerns. (See sample letter in Appendix B.)

The EUB will consider the evidence and apply its judgement to the question of whether you have conducted a complete notification program. Generally EUB staff follow the identified contact guidelines to determine whether an application meets the requirements of Section 26 of the *Energy Resources Conservation Act* (ERCA). The EUB cannot describe a precise consultation program to satisfy every case, as unique features of an application may necessitate additional work.

Where a pool is subject to unit operations or other approvals, for some application types you may notify the unit operator or approval holder on behalf of the relevant group having an interest in the pool. Otherwise, individual well licensees are the normal target for notification. In many cases, it is reasonable and expeditious to rely on this level of notification, but the EUB must be satisfied that it is effective.

The EUB will check to see if there are factors that might suggest a conflict of interest between the applicant and, for example, the unit operator. In such cases, the EUB will require either clarification evidence or more extensive direct notification of all parties having interests in the pool. As a general rule, potentially adversely affected parties have drilled lands within EUB-recognized pool boundaries. For this reason, mineral lessees or lessors of undrilled lands are not generally listed on Tables 1 and 2 as minimum contact requirements. They are noted in the tables for special cases where the nature of the activity may preclude or seriously affect long-term future opportunities. There may, however, be other situations where lessees or lessors should be notified, and the EUB will review applications for special circumstances in accordance with Section 26 of the ERCA.

Consequences of Incomplete Notification

Failure to identify or adequately notify potentially adversely affected parties may have serious effects on the progress of an application. The EUB is required to ensure that all potentially adversely affected parties have a reasonable opportunity to learn the facts of the application, furnish evidence relevant to the application, and provide input to the EUB's decision process.

If a hearing is not held in relation to the application, an affected party that contends it did not receive proper notice of the application and have an opportunity to make submissions in relation to it may request a hearing within 30 days of the date of the EUB's decision. If a hearing was held but notice of the hearing was not given to a potentially adversely affected party, the party may ask the Board to vary or rescind its approval or hold another hearing. In these cases, the EUB will expect the applicant to consult with the parties. If issues remain unresolved, the EUB will call a hearing and possibly suspend the approval in the interim period.

Table 1. Minimum notification requirements required prior to filing application[1]

Application type	Notification and confirmation of nonobjection from representative list as necessary to ensure coverage	Area of contact
EOR Scheme (Amendment) (2.1)	• All well licensees of wells that are completed in the pool	The applied-for approval area and the area within 800 m of any proposed enhanced oil recovery injector
EOR Scheme (New) (2.1)	• All well licensees of wells that are completed in the pool	The applied-for approval area and the area within a quarter section of the applied-for approval area
Gas Cycling Scheme (Amendment)	• All well licensees of wells that are completed in the pool	The applied-for approval area
Gas Cycling Scheme (New)	• All well licensees	The applied-for approval area and the area within one section of the applied-for approval area
Concurrent production (2.4)	• Unit operator (if applicable) • Approval holder of scheme (if applicable) • All well licensees	EUB-designated pool
Waste disposal (Class I)[2] (4.1)	Industry • Unit operator (if applicable) • Approval holder of scheme • All well licensees • All mineral lessees • All mineral lessors	A radius of 1.6 km from the proposed disposal well where the disposal zone is known to be present
	Public • Land owners and occupants	A radius of 0.5 km from the proposed disposal well
Acid gas disposal[3] (4.2)	• Unit operator (if applicable) • Approval holder of scheme (if applicable) • All well licensees • All mineral lessees • All mineral lessors	If into a depleted hydrocarbon pool, the EUB-designated pool; if into an aquifer, a radius of 1.6 km from the section containing the disposal well

Application type	Consultation and documentation of negotiations with	Area of contact
Rateable take (1.1)	• All well licensees	EUB-designated pool if present, otherwise applicant's pool interpretation
Common carrier/processor/ purchaser (1.2/1.3/1.4)	• Carrier, processors, or purchasers involved • All well licensees	Not applicable In pool
Compulsory pooling (1.5)	• All mineral lessees • All mineral lessors of unleased tracts	EUB-designated drilling spacing unit

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[1] Note that these are minimum requirements. The consequences of incomplete notification are discussed in the previous text.

[2] Notification and consent will be required as part of any request for a surface facility approval associated with waste disposal. A surface facility approval must be obtained from the EUB's Waste Operations Group and/or Alberta Environment before a waste disposal well approval can be issued.

[3] If a new emergency response plan (ERP) is needed or an existing ERP is updated, conduct notification for ERP purposes to all potentially adversely affected parties and provide confirmation of no objection or concerns.

Table 2. Minimum notification requirements required prior to EUB decision[1]

Application type	Notification and confirmation of nonobjection from representative list as necessary to ensure coverage	Area of contact
Special drilling spacing units (1.6)	Industry • Unit operator (if applicable) • Approval holder of scheme (if applicable) • All well licensees • All mineral lessees • All mineral lessors Public • Land owners and occupants	Industry The area of application plus one drilling spacing unit surrounding the area of application in the applied-for formation Public The area of application
Project and enhanced recovery recognition status (2.2/2.3)	• Not applicable	Not applicable
Commingled production (3.1)	• Unit operator (if applicable) • Approval holder of scheme (if applicable) • All well licensees	All wells in pools to be commingled
Good production practice/ special maximum limitation/gas-oil ratio penalty relief (3.2.2/3.2.3/3.2.4)	• Unit operator (if applicable) • Approval holder of scheme (if applicable) • All well licensees	EUB-designated pool
Gas allowable (3.3)	• Unit operator (if applicable) • Approval holder of scheme (if applicable) • All well licensees	EUB-designated pool plus 1600 m surrounding the pool
Disposal, except waste disposal (Class I) and acid gas disposal (see Table 1) (4.1)	• Unit operator (if applicable) • Approval holder of scheme (if applicable) • All well licensees	A radius of 1.6 km from the proposed disposal well where the proposed disposal zone is known to be present
Underground gas storage[3] (4.3)	Industry • Unit operator (if applicable) • Approval holder of scheme (if applicable) • All well licensees • All mineral lessees • All mineral lessors	The EUB-designated pool boundary of the proposed storage pool and a 1.6 km radius from that pool boundary; notification should cover all zones, including those that overlie and underlie the storage pool

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[1] Note that these are minimum requirements. The consequences of incomplete notification are discussed in the previous text.

Notification Glossary

Approval holder	A company named as the holder of an EUB approval that must ensure full compliance and speak on behalf of the scheme participants.
Confirmation of nonobjection	A signed letter stating that the party has no objections or concerns to the EUB approving the application is the preferred evidence. The EUB will consider accepting other documentation confirming nonobjection, such as minutes of a meeting or a copy of the correspondence and notice (see Appendix B).
EUB-defined pool (EUB G Order)	A pool recognized by the EUB. The G Order is available from EUB Information Services.
Landowner	1) The person in whose name a certificate of title has been issued pursuant to the Land Titles Act, or 2) if no certification of title has been issued, the Crown or other body administering the land.
Mineral lessee	The recipient of an oil or gas lease.
Mineral lessor	The conveyor of an oil or gas lease.
Notification	The process of asking for consent of potentially adversely affected owners for the proposed application includes providing a copy of the application and holding discussions as necessary with the interested parties.
Occupant	1) A person other than the owner who is in actual possession of the land. 2) A person who is shown on a certificate of title or by contract as having an interest in the land. 3) An operator granted a right of entry as defined in the Surface Rights Act in respect of land pursuant to a right of entry order as defined in that act. 4) In the case of Crown land, a person shown on the records of the department or other body administering the land as having an interest in the land. 5) The holder of a permit for a coal mine.
Representative list	A list of possible notification contacts in the order noted in Table 1 or 2.
Unit operator	A company designated by the unit participants to speak on their behalf.
Well licensee	The responsible holder of a well licence according to the EUB

Unit 1 Equity

1.1 Application for a Rateable Take Order

1.1.1 Background

The purposes of the Oil and Gas Conservation Act (the Act) are, among other things, to effect the conservation of oil and gas resources, to afford each owner the opportunity of obtaining its share of the production of oil or gas from any pool, and to provide for economic, orderly, and efficient development in the public interest. Section 36 of the Act mandates the EUB to address all three of these purposes. Historically this legislation has been used only in the equity context and to allow for economic, orderly, and efficient development; other sections of the Act have been used to ensure conservation of resources.

Under Section 36 the EUB may limit the amount of gas that may be produced and/or distribute the amount of gas that may be produced from a pool or part of a pool. Historically, this legislation has been used to authorize the distribution of gas production among wells in a nonassociated gas pool.

1.1.2 When to Make This Application

A situation that could warrant an application under Section 36 of the Act would typically involve a number of gas wells of different ownership in a pool being on production. One owner believes its reserves are being inequitably drained because its well has been placed on production at rates that do not allow the well to capture the owner's share of the pool reserves. The well's rate may be restricted by pipeline or processing capacity or by a gas sales contract.

In the case where the rate limitation is due to pipeline or processing capacity, the owner has capacity or its own facilities and believes that it would not represent economic, orderly, and efficient development to build or obtain additional capacity. Where the limitation is due to a gas sales contract, the owner has been unable to adjust the contract or produce gas in excess of the contract to allow for an equitable rate of production.

1.1.3 How the EUB Processes the Application

The EUB considers the issuance of a rateable take order to be a very significant action because it has the potential to override contractual arrangements put in place through normal business practices. Consequently, before approving an application, the EUB requires an applicant to demonstrate that it is being deprived of the opportunity to obtain its share of production from the pool. The applicant must show that drainage has occurred and continues to occur or that it can be expected to occur with a very high degree of certainty. Additionally, the drainage must be a result of the applicant not having an opportunity to produce its share of production. The restriction in rate must not be due to limitation in well capability. The EUB has previously ruled that where the only limitation on production is well capability, a producer is not being deprived of an opportunity to obtain an equitable share of production *(Decision 85-5)*.

Each application for a rateable take order proceeds to a public hearing.

1.1.4 Requirements for an Application for a Rateable Take Order (file 12 copies)

Requirements	Comments
1) A statement of what is being requested, including a) a reference that the application is being made under Section 36 of the Oil and Gas Conservation Act, and b) the pool and wells to which the order would apply.	For example, HP Gas Company applies for an order under Section 36 of the Oil and Gas Conservation Act distributing gas production among wells in the Woodword Viking A Pool, which includes the wells with the unique identifiers of …
2) A discussion giving the reasons why you are requesting the order, including a description of the circumstances that in your opinion have led or will lead to an inequitable situation.	
3) Documentation showing your attempts to negotiate a solution to the problem, including a) identification of all parties involved and the nature of their issues and concerns, and b) an outline of the attempts to resolve the issues, including type of discussions held, timing, and frequency.	You must have made substantial efforts to resolve the situation; the application should be a final resort. You should also continue your efforts to resolve the matter on a voluntary basis (including consideration of a third-party mediator) after the application has been filed with the EUB. Your discussion must include why the negotiations did not lead to a settlement and what dispute resolution efforts were conducted. Matters of confidentiality and disclosure should be addressed and determined by the parties prior to submission of the application.
4) Your geological interpretation of the pool involved, including a) a net pay isopach map of the pool, including both oil and gas if there is an associated pool, b) an interpreted and annotated log cross-section or representative well log(s) showing i) stratigraphic interpretation of the zone(s) of interest,	This information should show that your well is part of the subject pool. The net pay map should show the entire pool and illustrate wells outside the pool that control the edges of the pool. Where there is a dispute among the parties involved regarding the delineation of the pool(s) in question, an annotated cross-section should be included in the application; where there is no dispute respecting this issue, an annotated representative well log is sufficient for the purposes of the application.

Requirements	Comments
ii) interpretation of fluid interfaces present,	
iii) completions and treatments to the wellbore(s), with dates,	
iv) cumulative production,	
v) finished drilling date and kelly bushing (KB) elevation, and	
vi) the scale of the log readings, and	
c) a tabulation of the interpreted net pay, porosity, and water saturation for each well in the pool, along with the cutoffs, methodology, formulas, and constants used.	This allows the EUB to assess your mapping and reserves calculation requested in the following item. In addition, these data may be used to allocate production (see item 8 below).
5) An evaluation of the oil and gas reserves for the pool and for your lands, including	The reserves estimates confirm that there are reserves available for production.
a) an estimate of the initial oil volume and gas volume in place,	
b) an estimate of the oil and gas recovery factors,	
c) a description of the methods used in determining (a) and (b) above (e.g., material balance, volumetric analysis, model study, a comparison of analog pools), and	
d) the supporting data used in determining (a) and (b) above and the sources of the data (i.e., pressure/volume/temperature (PVT) properties and source, pressure data and source).	All data used in obtaining the reserves estimates should be provided so that your analysis can be duplicated using information supplied in this application.
6) Deliverability test data showing that your well is capable of producing at an economic rate from the pool to which the proposed order would apply.	A summary of the deliverability test data may be used provided the detailed test data have been filed in accordance with EUB *Guide 40*.

Requirements	Comments
7) Where drainage is alleged, a discussion including a) evidence showing that the reserves underlying your lands have been drained subsequent to the completion of your well in the pool, and b) an estimate of the total amount of inequitable drainage that has occurred from your lands since your well was completed in the pool, together with details of how the drainage was calculated.	In cases where a well has remained shut in, drainage may be confirmed by summarizing at least two pressure tests taken on the well. If you are arguing that your currently producing well is not producing at sufficient rates to recover an equitable share of production, a comparison may be made between the actual produced volume from the well and the volume the well should have produced to obtain an equitable share of production. You should present a detailed calculation showing how you determined your equitable share of production.
8) A discussion of your proposal as to how the EUB should restrict or distribute production from the pool that includes a) a tabulation of the proportion of production or rate of production that each well or group of wells should be allowed to produce, together with the details of how the proposed production scheme was obtained, and b) if considered appropriate, the total production rate proposed for the pool, together with the details of how this rate was determined and why such a rate should be set, and c) if specific rates are proposed under item 8(a), i) an indication of why rates, rather than a percentage allocation, are being proposed, ii) whether the proposed rates are economic for each well or group of wells, and iii) whether each well or group of wells would be capable of producing at	The EUB usually distributes production among wells in a pool on a percentage basis, rather than setting any specific rate or volume. The proportion of production allocated to each well is commonly based on the following formula: *Percentage of pool production for specific well = 100 x (wellbore net pay x porosity x gas saturation x area of spacing unit or validated area for specific well)/(sum of wellbore net pay x porosity x gas saturation x area of spacing units or validated areas for all wells)* *Guide 32* and *Decision 91-8* discuss the EUB's commonly used allocation formula and the validated area concept. The EUB has not commonly used mapping as a means to determine hydrocarbon pore volume in a spacing unit because in many cases such mapping is highly interpretative. The EUB has not normally factored the deliverability of a well into an allocation formula to avoid disputes on what constitutes appropriate well testing. You may propose an allocation formula other than the commonly used one; however, you should include detailed justification as to why the EUB should deviate from its usual practice in

Requirements	Comments
the proposed rate.	determining an allocation formula.
	It is not usually necessary to limit the total rate of production (item 8(b)), but this remains an option. In respect of item 8(c), it is not the EUB's usual practice to set specific rates, but this also remains an option. In some cases it may be useful to set minimum rates, with a percentage allocation above the minimum rate. If a well falls below the minimum rate, other wells are restricted only to their minimum rates and not below. Items 8(c)(ii) and 8(c)(iii) should be addressed only when there is likely to be a dispute about the economics of a proposed rate or about the capability of a well to produce at a specified rate.

1.2 Application for a Common Purchaser Order

1.2.1 Background

The Oil and Gas Conservation Act (the Act) affords each owner the opportunity of obtaining its share of the production of oil or gas from any pool. Accordingly, the EUB may issue a declaration of common purchasers of oil and gas under Sections 50(1) and 51(1) of the Act. Historically the EUB has not received applications filed under Section 50(1) respecting common purchasers of oil, as the prorationing of oil has been handled under other legislation. However the EUB has considered many applications under Section 51(1) respecting common purchasers of gas and, accordingly, existing practices primarily deal with the common purchasers of gas.

1.2.2 When to Make This Application

A situation that would warrant the filing of a common purchaser application with the EUB would be when the gas reserves associated with a well are being drained by other wells producing in the same pool because the owner of the well cannot obtain a reasonable market for its gas or negotiate a share of the existing markets of other owners with producing wells in the same pool. The well owner has recourse to apply for the declaration of a common purchaser in order to recover its share of gas from the pool.

1.2.3 Terms of Application

An order under Sections 50(1) and 51(1) of the Act obliges each common purchaser, among other things, to purchase production offered for sale to it without discrimination in favour of one producer or another in the same pool. Thus, a common purchaser order would allow an owner that has been unable to obtain its own market to share in the markets obtained by other owners in the pool.

Under Section 56 of the Act, an applicant filing a common purchaser application has the option of requesting that the common purchaser order be effective retroactively to the date of the application. The EUB considers such a request in light of the particular situation and has the discretion to grant the request, deny it, or provide some measure of retroactivity other than what was requested.

In order to give effect to a common purchaser order, an applicant filing a request for the declaration of a common purchaser of gas under Section 51(1) of the Act also has the option to request under Section 51(4)(a) or (b) that the EUB direct

- the point at which the common purchaser shall take delivery of gas offered for sale, and

- the proportion of gas that the common purchaser shall purchase from each producer or owner offering gas for sale.

Requests under Section 51(1) of the Act for the declaration of a common purchaser, Section 51(4)(a) for the designation of a delivery point, Section 51(4)(b) for allocation of production among wells in a pool, and Section 56 respecting the effective date of an order, should be included in the same application.

If there is a dispute as to the price to be paid by the common purchaser for the gas, either the common purchaser or an owner may also apply under the EUB to set the price under Section 55(2) of the Act. An applicant may choose to file an application for the EUB to set tariffs at the same time as it files an application for declaration of a common purchaser. However, in some cases where the EUB is prepared to grant a common purchaser order, the application for the setting of tariffs may be deferred to allow for additional negotiations.

1.2.4 How the EUB Processes the Application

In evaluating an application for a common purchaser order, the EUB considers

- whether drainage has occurred subsequent to the completion of a well on the applicant's property and, if so, to what extent,
- whether opportunities have existed for the marketing of production from the applicant's property and, if so, when and the nature of them, and
- future prospects for marketing the production.

Each application for a common purchaser order proceeds to a public hearing.

1.2.5 Requirements for an Application for a Common Purchaser Order (file 12 copies)

Requirements	Comments
1) A statement of what you are requesting, including a) the purchasers proposed as the common purchasers, b) the pool to which the common purchaser declaration would apply, and c) the proposed effective date of the order.	For example, Company X applies, pursuant to Section 51(1) of the Oil and Gas Conservation Act, for an order declaring Company Z as a common purchaser of gas produced from the Woodward Viking A Pool. Company X also requests, pursuant to Section 56 of the Oil and Gas Conservation Act, that the order be effective as of the date of the application and that, pursuant to Section 51(4)(b), the EUB direct the proportion of gas that the common purchaser shall purchase from each producer or owner offering gas for sale.
2) A statement of whether you are requesting, pursuant to Section 51(4) of the Oil and Gas Conservation Act, that the Board, to give effect to the common purchaser declaration, direct a) the point at which the common purchaser shall take delivery of gas offered for sale, and/or b) the proportion of gas that the common purchaser shall purchase from each producer or owner offering gas for sale.	

Requirements	Comments
3) A discussion of the reasons why you are requesting the subject order, including a description of the circumstances that in your opinion have led or will lead to an inequitable situation.	
4) Evidence that your well is completed in the pool to which the common purchaser is to apply, including	
a) a net pay isopach map of the pool, including both oil and gas if there is an associated pool,	The net pay map should show the entire pool and illustrate wells outside the pool that control the edges of the pool.
b) where pool delineation or fluid interfaces are based on structural interpretation, a structure contour map of the pool and offsetting area,	
c) an interpreted and annotated log cross-section or representative well log(s) showing	If there is a dispute among the parties involved regarding the delineation of the pool(s) in question, you should include an annotated cross-section in the application; where there is no dispute respecting this issue, an annotated representative well log is sufficient.
i) stratigraphic interpretation of the zone(s) of interest,	
ii) interpretation of the fluid interfaces present,	
iii) completions and treatments to the wellbore(s), with dates,	
iv) cumulative production,	
v) finished drilling date and kelly bushing (KB) elevation, and	
vi) the scale of the log readings, and	
d) a tabulation of the interpreted net pay, porosity, and water saturation for each well in the pool, along with the cutoffs, methodology, formulas, and constants used.	These data allow the EUB to assess your mapping and reserves calculations requested in the following item. In addition, these data may be used to allocate production (see item 13).
5) Data showing that the well is completed and capable of producing at an economic rate from the pool to which the common purchaser order is to apply.	

Requirements	Comments
6) An evaluation of the oil and gas reserves for the pool and for your lands, including	The reserves estimates confirm that there are reserves available for production.
a) an estimate of the initial oil volume and gas volume in place,	
b) an estimate of the oil and gas recovery factors,	
c) a description of the methods used in determining (a) and (b) above (i.e., material balance, volumetric analysis, model study, a comparison of analog pools), and	
d) the supporting data used in determining (a) and (b) above and the sources of the data (i.e., pressure/volume/temperature (PVT) properties and source, pressure data and source).	You should provide all data used in obtaining the reserves estimates so that your analysis can be duplicated.
7) A discussion of drainage, including	Drainage should be confirmed by summarizing at least two pressure tests obtained from the well.
a) evidence showing that the reserves underlying your lands have been drained subsequent to the completion of your well in the pool,	
b) an estimate of the total amount of drainage that has occurred from your lands since your well was completed in the pool, together with details of how the drainage was calculated, and	
c) estimates of the present and the expected future rate of drainage of your reserves in the absence of the common purchaser order, together with the details of how the estimates were obtained.	
8) A discussion of	You should have made substantial efforts to obtain your own markets and to negotiate a voluntary sharing of the existing markets of other owners in the pool. You should apply to the EUB only as a last resort. You should also continue your efforts to resolve the matter on a voluntary basis after filing the application with the EUB.
a) the opportunities that have existed for the marketing of gas or oil produced from your property, including documentation showing your attempts to obtain a market for your gas or oil, and	

Requirements	Comments
b) the future prospects for marketing the gas or oil.	
9) A map showing the areas in the pool from which each purchaser purchases gas or oil and the location of your property.	
10) A statement that the proposed common purchaser purchases, produces, or otherwise acquires gas or oil, as the case may be, from the pool containing your property.	
11) If appropriate, a statement specifying the reasons why all the purchasers in the pool are not being proposed as common purchasers.	
12) If you are requesting, pursuant to Section 51(4)(a) of the Oil and Gas Conservation Act, that the EUB, to give effect to the common purchaser declaration, direct the point at which the common purchaser shall take delivery of gas offered for sale to it,	
a) a discussion and documentation indicating what negotiations were carried out in regard to a delivery point and where the impasse lies,	
b) a statement of the proposed delivery point, together with a discussion of the reasons why you propose the location,	For each case, the economic analysis should include a detailed itemization of all costs (excluding sunk costs), forecasts of production and revenue streams, and tabulations of before-tax rate of return, payback, and present value analyses.
c) analyses of the economics of the proposed delivery point and alternate delivery points, and	
d) a discussion of the development and probable future development in the area.	

Requirements	Comments
13) If you are requesting, pursuant to Section 51(4)(b) of the Oil and Gas Conservation Act, that the EUB, to give effect to the common purchaser declaration, direct the proportion of the common purchaser's acquisitions of gas from the pool that it shall purchase from each producer or owner offering gas for sale,	The EUB's usual practice is to allocate production among wells in a pool on a percentage basis, rather than setting any specific rate or volume. The proportion of production allocated to each well is commonly based on the following formula: *Percentage of pool production for specific well = 100 x (wellbore net pay x porosity x gas saturation x area of spacing unit or validated area for specific well)/(sum of wellbore net pay x porosity x gas saturation x area of spacing units or validated areas for all wells).*
a) a discussion and documentation indicating what negotiations were carried out in regard to distributing production among wells in the pool and where the impasse lies, and	
b) a discussion of your proposal as to how the EUB should distribute production from the pool, including a tabulation of the percentage of total production that each well or group of wells should be allowed to produce, together with details of how the proposed scheme was obtained.	*Guide 32* and *Decision 91-8* offer discussions of the EUB's commonly used allocation formula and the validated area concept. The EUB has not commonly used mapping as a means to determine hydrocarbon pore volume in a spacing unit because in many cases such mapping is interpretive. The EUB has not normally factored the deliverability of a well into an allocation formula to avoid disputes on what constitutes appropriate testing of wells. You may propose an allocation formula other than the commonly used one; however, you should include detailed justification as to why the EUB should deviate from its usual practice in determining an allocation formula. In some cases it may be useful to set minimum rates, with a percentage allocation above the minimum rate. If a well falls below the minimum rate, other wells are restricted only to their minimum rates and not below.
14) If you are requesting, pursuant to Section 56 of the Oil and Gas Conservation Act, that the proposed order be effective prior to the date the order is issued but not prior to the date the application for the order was made to the EUB, a discussion as to why the order should be effective on the requested date, including	

Requirements	Comments
a) the steps that you have taken to market your production, and b) an indication of whether or not your well is tied into a gathering system and, if not, why the order should be made on a retroactive basis.	

1.3 Application for a Common Carrier Order

1.3.1 Background

The Oil and Gas Conservation Act (the Act) affords each owner the opportunity of obtaining its share of the production of oil or gas from any pool and provides for economic, orderly, and efficient development in the public interest. Accordingly, the EUB may issue a declaration of a common carrier of oil, gas, or synthetic crude oil under Section 48 of the Act.

1.3.2 When to Make This Application

A typical situation that would warrant the filing of a common carrier application with the EUB would be where an owner of a capable well has a market for its gas and has made arrangements to have the gas processed at a nearby plant. Its analysis shows the existing gathering system to be the only economic means of transporting its gas to the processing plant. However, the owner has been unsuccessful in negotiating an agreement on reasonable terms to use the existing pipeline. The well owner has recourse to apply for the declaration of a common carrier in order to obtain its share of gas from the pool.

1.3.3 Terms of Application

An order under Section 48 of the Act obliges each common carrier, among other things, to transport production without discrimination as between any of the owners for whom transportation is provided. Thus, a common carrier order would allow an owner to share in the existing capacity of the pipeline.

Under Section 56 of the Act, an applicant filing a common carrier application has the option of requesting that the common carrier order be effective retroactively to the date of the application. The EUB considers such a request in light of the particular situation and has the discretion to grant the request, deny it, or provide some measure of retroactivity other than what was requested.

In order to give effect to a common carrier order, an applicant filing a request for the declaration of a common carrier under Section 48(1) of the Act also has the option to request that the EUB direct

- the point at which the common carrier shall take delivery of the production (Section 48(4)(a)), and

- the proportion of production to be taken by the common carrier from each producer or owner offering production to be gathered, transported, handled, or delivered by means of a pipeline (Section 48(4)(b)).

Requests under Section 48(1) for the declaration of a common carrier, Section 48(4)(a) for the designation of a delivery point, Section 48(4)(b) for allocation of production among wells in a pool, and Section 56 respecting an effective date for the order should be included in the same application.

If there is a dispute as to the tariff to be paid to the common carrier, either the common carrier or an owner may also apply for the EUB to set the price under Sections 55(1) or 55(3) of the Act. An applicant may choose to file an application for the EUB to set tariffs at the same time as it files an application under Section 48. However, in some cases where the EUB is prepared to grant a common carrier order, the application for the setting of tariffs may be deferred to allow for additional negotiations.

1.3.4 How the EUB Processes the Application

In evaluating an application for a common carrier order, the EUB considers whether the applicant has demonstrated that

- producible reserves are available for transportation through an existing pipeline,
- there is a reasonable expectation of a market for the substance that is proposed to be transported by the common carrier operation,
- the applicant could not make reasonable arrangements to use the existing pipeline,
- the proposed common carrier operation is either the only economically feasible way or the most practical way to transport the substance in question or is clearly superior environmentally, and
- where application is being made under Sections 48(4)(a) and/or 48(4)(b) of the Act for the designation of a delivery point and/or the proportion of production to be delivered to the pipeline, that the applicant could not make reasonable arrangements on these matters.

Each common carrier application proceeds to a public hearing.

1.3.5 Requirements for an Application for a Common Carrier Order (file 12 copies)

Requirements	Comments
1) A statement of what is being requested, including	For example, Company X applies under Section 48 of the Oil and Gas Conservation Act for an order declaring Company Z to be a common carrier of gas produced from the Woodward Viking A Pool through a pipeline extending from LSD x to LSD y and including a field compressor located in LSD z. Company X also requests, pursuant to Section 56 of the Oil and Gas Conservation Act, that the order be effective as of the date of the application and that, pursuant to Section 48(4)(b) of the Oil and Gas Conservation Act, the EUB direct the proportion of production to be taken by the common carrier from each producer or owner.
a) a reference that you are making the application under Section 48 of the Oil and Gas Conservation Act,	
b) the name of the company to be designated as the common carrier,	
c) reference to the pool or pools to which the proposed common carrier declaration would apply, or if it is proposed that the order not apply to any specific pool, a discussion as to why the order should not apply to a specific pool or pools.	
d) the location of the pipeline(s) to which the proposed common carrier order would apply, including the proposed tie-in and terminating points, and	

Requirements	Comments
e) the proposed effective date of the order.	
2) A statement of whether you are requesting, pursuant to Section 48(4) of the Oil and Gas Conservation Act, that the EUB, to give effect to the common carrier declaration, direct a) the point at which the common carrier shall take delivery of production, and/or b) the proportion of production to be taken by the common carrier from each producer or owner.	
3) A discussion giving the reasons why you are requesting the subject order, including a description of the circumstances that in your opinion have led or will lead to an inequitable situation.	
4) Documentation showing that reasonable arrangements for the use of the pipeline could not be agreed upon, including a) identification of all parties involved and the nature of their issues and concerns, and b) an outline of the attempts to resolve the the issues, including type of discussions held, timing, and frequency.	You should have made substantial efforts to negotiate a resolution to the matter prior to filing an application with the EUB. The application should be a last resort. You should also continue your efforts to resolve the matter on a voluntary basis (including consideration of a third-party mediator) after filing the application with the EUB. Your discussion must include why the negotiations did not lead to a settlement and what dispute resolution efforts were conducted. Matters of confidentiality and disclosure should be addressed and determined by the parties prior to submission of the application. The documentation should illustrate your case that you have been unable to obtain reasonable arrangements. Matters of dispute may include access on terms that would allow you to obtain your share of production from the pool at reasonable tariffs.

Requirements	Comments
5) A statement specifying the operator and ownership of the pipeline to be subject to the proposed order.	
6) An indication of the available capacity of the pipeline to be subject to the proposed common carrier order.	
7) A map showing the location of the subject pool, pipeline(s), any alternative facilities, and your production facilities.	
8) Your geological interpretation of the pool involved, including	
a) a net pay isopach map of the pool, including both oil and gas if there is an associated pool,	The net pay map should show the entire pool and illustrate wells outside the pool that define the edges of the pool.
b) where pool delineation or fluid interfaces are based on structural interpretation, a structure contour map of the pool and offsetting area,	
c) an interpreted and annotated log cross-section or representative well log(s) showing i) stratigraphic interpretation of the zone(s) of interest, ii) interpretation of the fluid interfaces present, iii) completions and treatments to the wellbore(s), with dates, iv) cumulative production, v) finished drilling date and kelly bushing (KB) elevation, and vi) the scale of the log readings, and	If there is a dispute among the parties involved regarding the delineation of the pool(s) in question, you should include an annotated cross-section in the application; where there is no dispute respecting this issue, an annotated representative well log is sufficient.
d) a tabulation of the interpreted net pay, porosity, and water saturation for each well in the pool, along with the cutoffs, methodology, formulas, and constants used.	These data assist the EUB to assess your mapping and reserves calculations requested in the following item. In addition, these data may be used to allocate production (see item 14).
9) An evaluation of the oil and gas reserves for the pool and for your lands, including	The reserves estimates confirm that there are reserves available for production.

Requirements	Comments
a) an estimate of the initial oil volume and gas volume in place,	
b) an estimate of the oil and gas recovery factors,	
c) a description of the methods used in determining (a) and (b) above (e.g., material balance, volumetric analysis, model study, a comparison of analog pools), and	
d) the supporting data used in determining (a) and (b) above and the sources of the data (i.e., pressure/volume/temperature (PVT) properties and source, pressure data and source).	You should provide all data used in obtaining the reserves estimates so that your analysis can be duplicated.
10) A discussion of drainage including	Drainage is not a prerequisite for the issuance of a common carrier order but could be one factor in determining the need for an order. In addition, the EUB would consider the extent to which drainage has occurred in evaluating what the effective date of the order should be.
a) evidence showing that the reserves underlying your lands have been drained subsequent to the completion of your well in the pool, and	
b) an estimate of the total amount of inequitable drainage that has occurred from your lands since your well was completed in the pool, together with details of how the drainage was calculated.	In cases where a well has remained shut in, you may confirm drainage by summarizing a minimum of two pressure tests taken on the well. If you are arguing that your currently producing well is not producing at sufficient rates to recover an equitable share of production, you may make a comparison between the actual produced volume from the well and the volume the well should have produced to obtain an equitable share of production. You should present a detailed calculation showing how you determined your equitable share of production.
11) A discussion of the practicability, economics, and any environmental concerns of	For each case, the economic analysis should include a detailed itemization of all costs used (excluding sunk costs), forecasts of production and revenue streams, and tabulations of before-tax rate of return, payback, and present value analyses.
a) the proposed common carrier operation,	
b) the alternative of building new facilities,	
c) the alternative of using other facilities	

Requirements	Comments
(such as taking the gas to another existing plant), and d) any other alternatives available.	
12) A discussion of the availability or the reasonable expectation of a market for the oil, gas, or synthetic crude oil that would be transported in the common carrier operation.	
13) If you are requesting, pursuant to Section 48(4)(a) of the Oil and Gas Conservation Act, that the EUB, to give effect to the common carrier declaration, direct the point at which the common carrier shall take delivery of any production to be gathered, transported, handled, or delivered by means of the subject pipeline, a) a discussion and documentation indicating what negotiations were carried out in regard to a delivery point and where the impasse lies, b) a statement of the proposed delivery point, together with a discussion of the reasons why you propose the location, c) a statement of the proposed delivery point, together with a discussion of the reasons why you propose the location, d) analyses of the economics of the proposed delivery point and alternate delivery points, and e) a discussion of the development and probable future development in the area.	For each case, the economic analysis should include a detailed itemization of all costs (excluding sunk costs), forecasts of production and revenue streams, and tabulations of before-tax rate of return, payback, and present value analyses.
14) If you are requesting, pursuant to Section 48(4)(b) of the Oil and Gas Conservation Act, that the EUB, to give effect to the common carrier declaration, direct the proportion of production to be taken by the common carrier from each producer or owner offering production to be gathered, transported, handled, or delivered by means of the subject pipeline,	The EUB's usual practice is to allocate production among wells in a pool on a percentage basis, rather than setting any specific rate or volume. The proportion of production allocated to each well is commonly based on the following formula: *Percentage of pool production for specific well = 100 x (wellbore net pay x porosity x gas saturation x area of spacing unit or*

Requirements	Comments
a) a discussion and documentation indicating what negotiations were carried out in regard to distributing production among wells in the pool and where the impasse lies, and b) a discussion of your proposal as to how the EUB should distribute production from the pool that includes a tabulation of the proportion or percentage of total production that each well or group of wells should be allowed to produce, together with the details of how the proposed production scheme was obtained.	*validated area for specific well)/(sum of wellbore net pay x porosity x gas saturation x area of spacing units or validated areas for all wells).* *Guide 32 and Decision 91-8* offer discussions of the EUB's commonly used allocation formula and the validated area concept. The EUB has not generally used mapping as a means to determine hydrocarbon pore volume in a spacing unit because in many cases such mapping is highly interpretive. The EUB has not normally factored the deliverability of a well into an allocation formula to avoid disputes on what constitutes appropriate testing of wells. You may propose an allocation formula other than the commonly used one; however, you should offer detailed justification as to why the EUB should deviate from its consistent practice in determining an allocation formula. In some cases it may be useful to set minimum rates, with a percentage allocation above the minimum rate. If a well falls below the minimum rate, other wells are restricted only to their minimum rates and not below.
15) If you are requesting, pursuant to Section 56 of the Oil and Gas Conservation Act, that the proposed order be effective prior to the date the order is issued but not prior to the date the application for the order was made to the EUB, a discussion as to why the order should be effective on the requested date, including a) the steps that you have taken to market your production, and b) an indication of whether your well is tied into a gathering system and, if not, why the order should be made on a retroactive basis.	

1.4 Application for a Common Processor Order

1.4.1 Background

The Oil and Gas Conservation Act (the Act) affords each owner the opportunity of obtaining its share of the production of oil or gas from any pool and provides for economic, orderly, and efficient development in the public interest. Accordingly, the EUB may issue a declaration of a common processor of gas under Section 53 of the Act.

1.4.2 When to Make This Application

A typical situation that would warrant the filing of a common processor application with the EUB would be when an owner of a capable well has a market for its gas requiring processing to meet contract specifications. The owner believes it is desirable to use an existing plant, but it has been unsuccessful in negotiations to gain access to the plant on reasonable terms. The owner has recourse to apply for the declaration of a common processor in order to gain access to the plant and allow it to obtain its share of gas from the pool.

1.4.3 Terms of Application

An order under this section obliges each common processor, among other things, to process gas that may be made available for processing in the plant without discrimination in favour of one producer or owner as against another in the pool.

Under Section 56 of the Act, an applicant filing a common processor application has the option of requesting that the common processor order be effective retroactively back to the date of the application. The EUB considers such a request in light of the particular situation and has the discretion to grant the request, deny it, or provide some measure of retroactivity other than that requested.

In order to give effect to a common processor order, an applicant filing a request for the declaration of a common processor also has the option of requesting that the EUB direct

- the proportion of production to be processed by the common processor from each producer or owner in the pool (Section 53(5)(a)), and/or

- the total amount of gas to be processed by the common processor from the pool subject to the common processor declaration (Section 53 (5)(b)).

Requests under Section 53(1) of the Act for the declaration of a common processor, Section 53(5)(a) for the allocation of production among wells in the pool, Section 53(5)(b) of the Act for direction as to the total amount of gas to be processed by the common processor from the pool subject to the common processor declaration, and Section 56 of the Act respecting the effective date of the order should be included in the same application.

If there is a dispute as to the tariff to be paid to the common processor, either the common processor or an owner may also apply under Section 55(2) of the Act for the EUB to set the price.

An applicant may choose to file an application for the EUB to set tariffs at the same time as it files an application under Section 53. However, in some cases where the EUB is prepared to grant a common processor order, the application for the setting of tariffs may be deferred to allow for additional negotiations.

1.4.4 How the EUB Processes the Application

In evaluating an application for a common processor order, the EUB considers whether the applicant has demonstrated that

- producible reserves are available for processing and processing facilities are needed,
- reasonable arrangements for use of processing capacity in the subject processing plant could not be agreed upon by the parties,
- the proposed common processor operation is either the only economically feasible or most practical way to transport the gas in question or is clearly superior environmentally, and
- when an application is being made under Sections 53(5)(a) and/or 53(5)(b) of the Act for the allocation of production and/or a direction of the total volume of gas from the pool to be processed at the plant, that the applicant could not make reasonable arrangements on these matters.

Each application for a common processor order proceeds to a public hearing.

1.4.5 Requirements for an Application for a Common Processor Order (file 12 copies)

Requirements	Comments
1) A statement of what is being requested, including a) a reference that you are making the application under Section 53 of the Act, b) the name of the company to be designated as the common processor, c) a reference to the pool or pools to which the proposed common processor declaration would apply, d) the name and the location of the processing plant to which the proposed common processor order would apply, and e) the proposed effective date of the order.	For example, Company X applies under Section 53 of the Oil and Gas Conservation Act for an order declaring Company Z to be a common processor of gas produced from the Woodward Viking A Pool through the Grande Coulee Gas Plant located at LSD. Company X also requests, pursuant to Section 56 of the Oil and Gas Conservation Act, that the order be effective as of the date of the application and that, pursuant to Section 53(5)(a) of the Oil and Gas Conservation Act, the EUB direct the proportion of production to be taken by the common processor from each producer or owner in the Woodward Viking A Pool.

Requirements	Comments
2) A statement of whether you are requesting, pursuant to Section 53(5) of the Oil and Gas Conservation Act, that the EUB, in order to give effect to the common processor declaration, direct a) the proportion of production to be processed by the common processor from each producer or owner in the pool or pools, and/or b) the total amount of gas to be processed by the common processor from the pool or pools subject to the common processor declaration.	
3) A discussion giving the reasons why you are requesting the order, including a description of the circumstances that in your opinion have led or will lead to an inequitable situation.	
4) Documentation showing that reasonable arrangements for the use of processing capacity in the plant could not be agreed upon, including a) identification of all parties involved and the nature of their issues and concerns, and b) an outline of the attempts to resolve the issues, including type of discussions held, timing, and frequency.	You should have made substantial efforts to negotiate a resolution to the matter prior to filing an application with the EUB. The application should be a last resort. You should also continue your efforts to resolve the matter on a voluntary basis (including consideration of a third-party mediator) after you have filed the application with the EUB Your discussion must include why the negotiations did not lead to a settlement and what dispute resolution efforts were conducted. Matters of confidentiality and disclosure should be addressed and determined by the parties prior to submission of the application. The documentation should illustrate your case that you have been unable to obtain reasonable arrangements. Matters of dispute may include access on terms that would allow you to obtain your share of production from the pool at reasonable tariffs.
5) A map showing the location of the subject pool, processing plant, any alternative facilities, and your production facilities.	

Requirements	Comments
6) A statement specifying the operator and ownership of the processing plant.	
7) A discussion of	
a) the total processing capacity of the plant,	
b) the volumes of gas from the pool or pools to be subject to the proposed common processor declaration and from other pools currently processed at the subject plant, and	
c) the processing capacity available to you in the plant.	
8) An analysis of the composition of the gas to be processed under the common processor declaration, together with a discussion as to the capability of the plant to process the subject gas.	
9) Your geological interpretation of the pool involved, including	
a) a net pay isopach map of the pool, including both oil and gas if there is an associated pool,	The net pay map should show the entire pool and illustrate wells outside the pool that control the edges of the pool.
b) where pool delineation or fluid interfaces are based on structural interpretation, a structure contour map of the pool and offsetting area,	
c) an interpreted and annotated log cross-section or representative well log(s) showing	If there is a dispute among the parties involved regarding the delineation of the pool(s) in question, you should include an annotated cross-section in the application; if there is no dispute respecting this issue, an annotated representative well log is sufficient.
i) stratigraphic interpretation of the zone(s) of interest,	
ii) interpretation of the fluid interfaces present,	
iii) completions and treatments to the	

Requirements	Comments
wellbore(s), with dates,	
iv) cumulative production,	
v) finished drilling date and kelly bushing (KB) elevation, and	
vi) the scale of the log readings, and	
d) a tabulation of the interpreted net pay, porosity, and water saturation for each well in the pool, along with the cutoffs, methodology, formulas, and constants used.	These data assist the EUB to assess your mapping and reserves calculations requested in the following item. In addition, the data may be used to allocate production (see item 14).
10) An evaluation of the oil and gas reserves for the pool and for your lands, including	The reserve estimates confirm that there are reserves available for production.
a) an estimate of the initial oil volume and gas volume in place,	
b) an estimate of the oil and gas recovery factors,	
c) a description of the methods used in determining (a) and (b) above (e.g., material balance, volumetric analysis, model study, a comparison of analog pools), and	
d) the supporting data used in determining (a) and (b) above and the sources of the data (e.g., pressure/volume/temperature (PVT) properties and source, pressure data and source).	You should provide all data used in obtaining the reserves estimates so that your analysis can be duplicated.
11) A discussion of drainage including	Drainage is not a prerequisite for the issuance of a common processor order but could be one factor in determining the need for an order. In addition, the EUB considers the extent to which drainage has occurred in evaluating what the effective date of the order should be.
a) evidence showing that the reserves underlying your lands have been drained subsequent to the completion of your well in the pool, and	
b) an estimate of the total amount of inequitable drainage that has occurred from your lands since your well was completed in the pool, together with details of how the drainage was	In cases where a well has remained shut in, you can confirm drainage by summarizing a minimum of two pressure tests taken on the well. If you are arguing that your currently producing well is not producing at sufficient

Requirements	Comments
calculated.	rates to recover an equitable share of production, you may make a comparison between the actual produced volume from the well and the volume the well should have produced to obtain an equitable share of production. You should present a detailed calculation showing how you determined your equitable share of production.
12) A discussion of the practicability, economics, and any environmental concerns of a) the proposed common processor operation, b) the alternative of building new facilities, c) the alternative of using other facilities (such as taking the gas to another existing plant), and d) any other alternatives available.	For each case, the economic analysis should include a detailed itemization of all costs (excluding sunk costs), forecasts of production and revenue streams, and tabulations of before-tax rate of return, payback, and present value analyses.
13) A discussion of the availability or the reasonable expectation of a market for your gas that would be processed at the plant.	
14) If you are requesting, pursuant to Section 53(5)(a) of the Oil and Gas Conservation Act, that the EUB, in order to give effect to the common processor declaration, direct the proportion of production to be processed by the common processor from each producer or owner in the pool or pools, a) a discussion and documentation indicating what negotiations were carried out in regard to distributing production among wells in the pool and where the impasse lies, b) a discussion of your proposal as to how the EUB should distribute production from the pool, including a tabulation of the proportion or percentage of total production that each well or group of wells should be allowed to produce.	The EUB's usual practice is to allocate production among wells in a pool on a percentage basis, rather than setting any specific rate or volume. The proportion of production allocated to each well is commonly based on the following formula: *Percentage of pool production for specific well = 100 x (wellbore net pay x porosity x gas saturation x area of spacing unit or validated area for specific well)/(sum of wellbore net pay x porosity x gas saturation x area of spacing units or validated areas for all wells).* *Guide 32* and *Decision 91-8* offer discussions of the EUB's commonly used allocation formula and the validated area concept. The EUB has not generally used mapping as a means to determine hydrocarbon pore volume in a spacing unit because in many

Requirements	Comments
together with the details of how the proposed production scheme was obtained.	cases such mapping is highly interpretive. The EUB has not normally factored the deliverability of a well into an allocation formula to avoid disputes on what constitutes appropriate testing of wells. You may propose an allocation formula other than the commonly used one; however, you should offer detailed justification as to why the EUB should deviate from its consistent practice in determining an allocation formula. In some cases it may be useful to set minimum rates, with a percentage allocation above the minimum rate. If a well falls below the minimum rate, other wells are restricted only to their minimum rates and not below.
15) If you are requesting, pursuant to Section 53(5)(b) of the Oil and Gas Conservation Act, that the EUB, to give effect to the common processor declaration, direct the total amount of gas to be processed by the common processor from the pool or pools subject to the common processor declaration, a) a statement of why you believe such a total volume should be set, b) a discussion and documentation indicating what negotiations were carried out in regard to the total amount of gas to be processed by the common processor from the pool or pools subject to the common processor declaration and where the impasse lies, and c) a statement of the total amount of gas you propose be processed by the common processor from the pool or pools subject to the common processor, together with a discussion of how the volume was determined.	
16) If you are requesting, pursuant to Section 56 of the Oil and Gas Conservation Act, that the proposed order be effective prior to the date the order is issued but not prior to the date the application for the order was made to the EUB, a discussion as to why the order should	

Requirements	Comments
be effective on the requested date, including a) the steps that you have taken to market your production, and b) an indication of whether your well is tied into a gathering system and, if not, why the order should be made on a retroactive basis.	

1.5 Application for a Compulsory Pooling Order

1.5.1 Background

Section 5.005 of the Oil and Gas Conservation Regulations specifies that no well shall be produced unless there is common ownership throughout the drilling spacing unit (DSU). This means that if there are separate tracts within a DSU with different ownership, all owners within the DSU must have an arrangement to share in the costs and revenues associated with drilling and producing a well from that spacing unit. This type of arrangement is generally referred to as a pooling agreement. In most cases, mineral holders negotiate voluntary pooling arrangements. However, if an owner attempts but fails to negotiate a satisfactory pooling arrangement in a reasonable period of time, or a tract owner is missing and untraceable, or there is a dispute as to the ownership of a tract, the owner wishing to drill a well may apply to the EUB for a compulsory pooling order. This order serves the same purpose as a voluntary pooling arrangement by ensuring that each owner in the DSU shares appropriately in the costs and revenues associated with a well in the DSU.

The EUB's role in pooling matters, therefore, is to offer a regulatory avenue to resolve problems relating to pooling issues, thereby allowing each owner the opportunity to obtain its share of oil and gas from any pool.

Applications for compulsory pooling are made

- under Section 80 of the Oil and Gas Conservation Act (the Act);
- if there is a missing and untraceable owner in the spacing unit, under both Sections 80 and 85 of the Act (Section 85 provides that the revenues associated with the missing and untraceable owner be paid to the Public Trustee); and
- if there is a dispute as to the ownership of a tract or ownership is unknown, under both Sections 80 and 86 of the Act (Section 86 provides that revenues associated with the disputed tract be paid to the Provincial Treasurer to be held in trust pending an order of the Court of Queen's Bench or until a settlement has been reached by the parties).

The EUB's current policies and practices respecting pooling arise from a combination of specific provisions of the Oil and Gas Conservation Act, historical decisions made by the EUB, consultations with industry, and EUB decisions resulting from pooling applications considered at public hearings. These avenues have resulted in an EUB pooling order with standard terms. Nonstandard terms are included in an order only where there is substantial justification to do so. General information on major EUB policies and practices respecting pooling and the standard terms of a pooling order are noted below in the Requirements sections. More detailed information can be obtained from EUB staff.

1.5.2 How the EUB Processes the Application

EUB staff initially review a pooling application for completeness. If additional information is required, a letter is issued itemizing the information required. Processing of the application is deferred pending receipt of the requested information.

Except in cases involving missing and untraceable owners or minor amendments to existing pooling orders, once an application is complete the EUB normally issues a notice of hearing respecting the application. The notice of hearing would not usually be published in any newspapers but sent directly to parties with an interest in the petroleum and/or natural gas underlying the DSU. Interested parties would have a specified time period in which to file any objections they may have respecting the application.

If no objections are received in response to the notice of hearing, the EUB cancels the hearing and makes a decision on the application without a hearing. When approval is granted, the EUB proceeds with the steps required to issue a pooling order. This includes obtaining the approval of the Lieutenant Governor in Council to issue the order. If a valid objection to an application is filed, the scheduled hearing would proceed and the EUB would consider the application and the concerns raised.

In a few cases when it is warranted, the EUB may issue a Notice of Applications, rather than a notice of hearing. Again, the Notice of Applications is not usually published in any newspapers but is sent directly to parties with an interest in the petroleum and/or natural gas underlying the DSU. Interested parties would have a specified time period in which to file any objections they may have respecting the application. If no objections are received in response to the Notice of Applications, the EUB makes a decision on the application without further notice or a hearing. When approval is granted, the EUB proceeds with the steps required to issue a pooling order. This includes obtaining the approval of the Lieutenant Governor in Council to issue the order.

If a valid objection to an application is filed, the EUB schedules a public hearing to consider the application and the concerns raised.

1.5.3 Requirements for an Application for a Compulsory Pooling Order (file 12 copies)

Requirements	Comments
1) A statement of what you are requesting, including	
a) a reference to which section(s) of the Oil and Gas Conservation Act under which you are making the application, and	You should reference Section 80 of the Act and, if applicable, Sections 85 and 86. For example: Company X is applying for a compulsory pooling order for the production of gas under Section 80 of the Act in the DSU constituting Section 13-45-12W4M.
b) the legal description of the DSU involved.	The size of the DSU involved should be consistent with the substance to be pooled (oil or gas). Thus, oil would normally be pooled within a standard oil DSU of a quarter section, while gas would be pooled within a standard gas DSU of one section. Compulsory pooling occurs only within a single DSU. Section 80 of the Act does not allow for compulsory pooling within several DSUs.

<table>
<tr><th>Requirements</th><th>Comments</th></tr>
<tr><td>2) A statement providing the legal description of each tract within the DSU and the ownership of that tract, together with a table showing the mailing addresses for all lessors and lessees (except the Crown).</td><td>For example, for the gas DSU constituting Section 13-45-12W4M:
<table>
<tr><th>Tract</th><th>Ownership
Lessor</th><th>Lessee</th></tr>
<tr><td>SW quarter</td><td>Crown</td><td>Company A</td></tr>
<tr><td>SE quarter</td><td>Freehold – ½ undivided J. Doe</td><td>Company A</td></tr>
<tr><td></td><td>½ undivided P. Doe</td><td>Not leased</td></tr>
<tr><td>North half</td><td>Freehold Company B</td><td>Company A</td></tr>
</table>
You should provide the mailing addresses of all lessors (except the Crown) and lessees as an attachment to the application. This allows the EUB to provide notice of the application to all potentially adversely affected parties.</td></tr>
<tr><td>3) A statement of the formation to which you propose to drill or from which you propose to produce.</td><td>The formation subject to the pooling order would be referenced in the order. In previous pooling applications where there has been a dispute about which formations should be subject to a pooling order, the EUB decided to limit the formation subject to the order to the known productive zone or to the major productive zone (<i>Examiner Reports 91-6, 95-2</i>).</td></tr>
<tr><td>4) A statement that an agreement to operate the tracts as a unit cannot be made on reasonable terms.</td><td></td></tr>
<tr><td>5) The particulars of the efforts you have made to obtain a voluntary agreement, including
a) identification of all parties involved and the nature of their issues and concerns,
b) an outline of the attempts to resolve the issues, including type of discussions held, timing, and facilities, and
c) an indication of your view of why attempts to obtain a voluntary pooling arrangement have failed in each case.</td><td>You should have made substantial efforts to negotiate a voluntary pooling arrangement. The application should be a last resort. You should also continue your efforts to resolve the matter on a voluntary basis (including considerations of a third-party mediator) after the filing the application with the EUB.
Your discussion must include why the negotiations did not lead to a settlement and what dispute resolution efforts were conducted. Matters of confidentiality and disclosure should be addressed and determined by the parties prior to submission of the application.
A description of your efforts to resolve the situation should include a summary of</td></tr>
</table>

Requirements	Comments
	telephone calls and meetings and copies of relevant correspondence.
6) If there is a well on the DSU that is to be produced under the proposed pooling order, a statement of the unique identifier of the well and its producing formation or formations.	The well to be subject to the pooling order would be referenced in the pooling order.
7) If there is not a well on the DSU drilled to the formation(s) referred to in item 3, a statement indicating the location (LSD) of the well to be drilled.	The proposed well location would be included in the pooling order.
8) If there is not a well on the DSU drilled to the formation(s) referred to in item 3, a statement that if an order is made by the EUB, you are prepared to drill a well to the formation(s) in question, and in the event that no production of gas or oil is obtained, you will pay all costs incurred in the drilling and abandonment of the well in accordance with Section 80(2)(f) of the Act.	
9) If there is not a well drilled on the DSU, an indication of whether you would see any difficulty in drilling the well within six months of the date of the proposed order if issued, and if so, an indication of what would be a more appropriate time limit to drill.	Section 74(2) of the Act implies that a well should be drilled within six months of the date of the order.
10) A statement of the operator to be appointed for the well of interest in the proposed pooling order.	All pooling orders normally include a clause that names the operator of the well subject to the pooling order.
11) A statement that the allocation of costs and revenues under the pooling order would be on a tract area basis, or where allocation is proposed to be on a basis other than an area basis, the proposed allocation and the details of how the allocation was determined, including	Section 80(4)(c) of the Act indicates that allocation shall be on an area basis unless it can be shown to the EUB that this is inequitable. Thus, allocation on an area basis is the normal provision of a pooling order, and an applicant would not need to justify why it has chosen to request an area-based allocation.

Requirements	Comments
a) a net pay isopach map of the pool, including both oil and gas if there is an associated pool,	
b) where pool delineation or fluid interfaces are based on structural interpretation, a structure contour map of the pool and offsetting area,	
c) an interpreted and annotated log cross-section or representative well log(s) showing i) stratigraphic interpretation of the zone(s) of interest,	If there is a dispute among the parties involved regarding the delineation of the pool(s) in question, you should include an annotated cross-section in the application; if there is no dispute respecting this issue, an annotated representative well log is sufficient.
ii) interpretation of the fluid interfaces present,	
iii) completions and treatments to the wellbore(s), with dates,	
iv) cumulative production,	
v) finished drilling date and kelly bushing (KB) elevation, and	
vi) the scale of the log readings, and	
d) a tabulation of the interpreted net pay, porosity, and water saturation for each well in the pool, along with the cutoffs, methodology, formulas, and constants used.	
12) A statement indicating whether you are proposing that the requested order provide for the equalization of the actual cost of drilling the well to and completing it in the formation(s) named in the pooling order, in accordance with Section 80(4)(d) of the Act.	This is a standard provision of a typical pooling order. It applies to a situation where an applicant has itself drilled a well for the purpose of producing the zone to be subject to the pooling order or is proposing to drill such a well. Where the case is not the standard one—for example, where a well was drilled and produced from a zone other than the one to be subject to the pooling order—it would normally be appropriate to modify the standard provision such that not all original drilling and completion costs would be shared.

Requirements	Comments
13) A statement as to whether you are proposing that the requested order provide for a penalty to be imposed against actual drilling and completion costs in accordance with Section 80(5) of the Act and, if so, a) what penalty should be imposed, b) the justification for the proposed penalty, and c) confirmation that in accordance with normal EUB practice, you would agree that the proposed penalty would be applied if the tract owner did not pay its share of actual drilling and completion costs within 30 days of the pooling order being issued, the well commencing production, and the tract owner being notified in writing of its share of costs, whichever is later; or where you are proposing an alternative to the EUB's normal practice, a justification of why the EUB should depart from its normal practice in this case.	A penalty under Section 80(5) of the Act is a standard provision of pooling orders involving disputes between industry players. In these cases, the EUB has normally provided for the maximum penalty allowed by Section 80(5). That is, where the maximum penalty applies and a tract owner has chosen to incur the penalty rather than pay costs "up front," the tract owner would owe the well operator its share costs plus the penalty of two times the cost. If the tract owner's share of costs were $10 000 and it chose to incur the penalty, it would pay costs of $10 000 plus two times the costs, equaling $20 000, for a total of $30 000.

1.6 Application for a Special Drilling Spacing Unit (DSU) Order

1.6.1 Background

The EUB has authority under the Oil and Gas Conservation Act (the Act) to designate drilling spacing units (DSU) and target areas and to make or amend regulations pertaining to them. DSUs are designed to promote efficient reservoir management, protect the correlative rights of the respective mineral right owners, and aid in resolving conflicts with surface operations where well site location is an issue. These objectives are accomplished by

- establishing an appropriate well density and pattern to drain the reservoir efficiently and economically in a reasonable period of time,
- avoiding unfair drainage by prohibiting or penalizing the production of wells that encroach on the mineral rights of offset owners, and
- providing flexibility to move a well site location to avoid conflict with surface land operations.

Part 4 of the Oil and Gas Conservation Regulations prescribes normal DSUs and target areas for conventional oil and gas wells in Alberta. Normal well density is limited to one well per DSU per pool. An operator wishing to drill and produce additional wells must apply for approval prior to placing subsequent wells on production.

1.6.2 When to Make This Application

An application for a change in well spacing should, in most cases, be made prior to drilling and would accommodate one or more of the following circumstances:

- change in target area
- fractional section
- reduced DSUs
- suspension of well spacing and target area requirements (holding and units)

You may apply for a change in the target area of a DSU in order to avoid a surface obstruction or to access a geological feature for a single well, provided that the change does not have an adverse impact on the equity of offset well owners. An application for a change in target area is submitted in accordance with Section 4.040(1) of the Oil and Gas Conservation Regulations.

If a fractional section contains a tract of land that differs in size by more than 5 per cent from a normal DSU, you must apply for approval of the tract as a DSU, pursuant to Section 4.050(1) of the Oil and Gas Conservation Regulations. The EUB will consider an application to establish a tract of land as a DSU as long as the tract is at least half the size of the DSUs prescribed for the area. A tract that is too small to be a stand-alone DSU may be joined with an adjacent DSU only if common ownership exists between the two.

During the development phase of a pool, it is sometimes apparent that normal DSUs do not provide an adequate well density for proper drainage. To accommodate an increase in well density, you may apply to the EUB to reduce the size of your DSUs, pursuant to Section 4.040(3) of the Oil and Gas Conservation Regulations, on the basis of one of the following:

- Improved recovery will be obtained.

- Additional wells are desirable to provide capacity to drain the pool at an increased rate or deliverability while not adversely affecting the ultimate recovery of reserves from the pool.

- The requested DSUs would be in a pool in which there are DSUs of such reduced size.

You may apply to suspend the DSU and target area provisions (holdings and units) for an area pursuant to Section 71(4) of the Oil and Gas Conservation Act for the following reasons:

- Local geologic or topographical conditions may make it impractical to develop an area by drilling to prescribed target areas.

- Poor or irregular drainage of existing wells may make it necessary to drill infill wells to capture trapped or bypassed oil.

- High water production may have limited the effective drainage radius of existing wells, creating a need to locate wells closer than permitted on reduced DSUs.

In their place a minimum interwell distance, a buffer zone distance between a well and the boundary of the development, and where necessary a maximum well density may be substituted, making it possible to drill wells without regard for DSU or target area restrictions.

A prerequisite for the suspension of DSUs and target areas is the establishment of either a holding (an area of common mineral right ownership at both the lessor and lessee level) or a unit. A holding is established in accordance with Section 5.190 of the Oil and Gas Conservation Regulations.

1.6.3 How the EUB Processes the Application

The EUB follows the general outline shown in Figures 1 and 2.

1.6.4 Requirements for an Application for a Special DSU Order (file 3 copies)

Equity

Equity is the most common issue dealt with in well spacing. One of the objectives of the Oil and Gas Conservation Act is to afford each owner the opportunity of obtaining its share of the production of oil or gas from any pool. The following information requirements deal with equity.

Requirements	Comments
1) A statement referencing the provisions of the act or regulation under which the application is made.	
2) Maps showing	You can determine the size of the existing DSU by checking the spacing unit (SU) order for the appropriate field.
a) the lessors and lessees in the applied-for formation within the area of application and in one DSU surrounding the area of application, and	Lessor and lessee information must be **accurate** and shown on a map or maps of sufficient scale to facilitate a quick review of the mineral right ownership. For a large area of application, a smaller scale map coded to a list of mineral right owners may be used. **DO NOT** send title search documents, as they add unnecessary bulk to the application and do not permit a quick review.
b) wells in the area and status of each.	
3) Statements of	
a) the legal description of the area of application,	
b) the proposed size, target areas, and orientation of the DSUs, and	See Sections 4.020 and 4.030 of the Oil and Gas Conservation Regulations.
c) the names of the formations to which the application applies.	
4) If you are applying for the suspension of DSUs and target areas in a holding or unit,	A holding requires common ownership at the lessor and lessee levels. For the purpose of a holding, common ownership is defined in Section 1.020(2)(4) of the Oil and Gas Conservation Regulations.
a) the proposed well density and interwell distance within the area of application, and	Interwell and buffer zone distances are derived from the DSUs and target areas previously approved in the area of application. For example, if one was to suspend the spacing requirements in an area subject to 16 hectare spacing, then the interwell distance and buffer zone would be 200 m and 100 m respectively, based on central target areas. Deviation from these distances would require information
b) the proposed minimum distance from a producing well to the boundary of the area of application.	

Requirements	Comments
	supporting the need to change these distances. An applicant may be required to submit an economic analysis of the development on the existing well spacing and the proposed well spacing should the need for the well spacing change be challenged.
5) A statement explaining how the proposed spacing change will affect the correlative rights of the offset mineral rights owners.	

Conservation

It is the EUB's responsibility to ensure that a reservoir is developed in a manner that maximizes the recovery of the resource. This is accomplished by establishing an appropriate well density and pattern to drain the reservoir in an efficient and economic manner. The following information requirements deal with conservation.

Requirements	Comments
1) Tabulations showing the productivity of wells in the area.	
2) A discussion and data that support the need for a change in well spacing. This may include, but is not limited to, the following: a) limited reservoir drainage due to coning of underlying water or overlying gas, b) limited drainage due to poor reservoir transmissibility, c) bypassed or trapped reserves, and d) topographic features or unique subsurface geology that prohibit the drilling to prescribed target areas.	A change in target area based on topographic features or subsurface geology for a single DSU would not be approved if the change adversely affects the equity of the offset mineral right owner.
3) A discussion on how the proposed spacing change will affect hydrocarbon recovery.	For example, will the spacing change lead to an increase in hydrocarbon recovery, or will it just reduce the amount of time it takes to recover the hydrocarbon resource?

Surface Impacts

Generally, one does not think in terms of surface impacts when dealing with an application that establishes a subsurface well spacing pattern. However, a change in well spacing that provides for an increase in well density has the potential of affecting the surface owner through the increased number of well sites and subsequent interference with surface land operations. Consultation with the landowner at the spacing application stage provides advance notice that a change to the spacing rules has been requested and provides an opportunity for the landowner to identify concerns and subsequent remedies prior to the drilling of any wells. The following information requirements deal with surface impacts.

Requirements	Comments
1) A description of the land use in the area of application.	
2) Where the land use is agricultural, a description of how the proposed spacing change will impact the surface land use.	
3) A statement confirming whether the surface owners or occupants in the area of application have been contacted about the proposed spacing change and, if contacted, a summary of their views.	At present it is not mandatory to consult or provide notification to the parties listed in Table 2 of the Resources Applications Notification Guidelines. However, if you have not done this, the EUB must provide notice to the potentially adversely affected parties and provide a period of time for the submission of comments or objections. This will add three to four weeks to process the application.
4) The names and mailing addresses of the surface owners and/or occupants in the area of application.	

Reduced Information Requirements

For applications that meet the following criteria, you only need to submit the information requirements in the Equity section:

- Application for a change in target area where you have obtained the consent of the surface owner and/or occupant and the mineral right owner who is being encroached upon.

- Application for reduced DSUs and suspension of DSUs and target area requirements where

    i) you are applying for the identical well spacing to that previously approved in the pool or the immediately adjacent area, and

    ii) you have obtained the consent of the surface owners/occupants

Unit 2 Conservation

2.1 Application for an Enhanced Recovery Scheme

2.1.1 Introduction

2.1.1.1 Background

Enhanced recovery (ER) involves the improvement of hydrocarbon recovery through the injection of fluid(s) into a hydrocarbon reservoir to

- add to or maintain reservoir energy (pressure),
- displace hydrocarbons to production wells, or
- alter the reservoir fluids so that hydrocarbon flow and recovery are improved.

An application to implement or amend an ER scheme is required in accordance with Section 39(1)(a) of the *Oil and Gas Conservation Act*. Additional approvals from the EUB or other government agencies may also be required to implement an ER scheme.

If changes to an existing ER scheme approval are required, an application must be made for the appropriate amendment(s).

2.1.1.2 Application Process

A) How to Make an ER Scheme Application

An ER application must be made using the Enhanced Recovery Scheme application form (see Appendix I). This form, in addition to Schedule 1 and the required attachments, must be included in the application. This information should be submitted electronically using the Electronic Application Submission (EAS) process accessed through the Digital Data Submission (DDS) screen on the EUB's Web site www.eub.gov.ab.ca. Whether received electronically or in paper form, the EUB will validate all applications to ensure that the requirements for ER schemes have been met. Incomplete applications or those containing significant errors will be closed.

This application process does not apply to crude bitumen ER schemes in the oil sands areas. An application for these schemes must be submitted in paper form (outside of EAS) and must comply with the *Oil Sands Conservation Act* (Section 10 for new schemes, or Section 13 for an amendment to an existing scheme).

B) How the EUB Processes the Application

The EUB reviews all ER scheme applications to ensure that hydrocarbon recovery will be optimized and that all ER scheme requirements are met. ER scheme applications meeting the base criteria detailed in Figure 2.1 will be processed in an expedited manner under a quick ER application process.

Those applications qualifying for the quick process will be dispositioned under a process that shifts the review emphasis from scheme design (application) to scheme performance (audit). Applications not meeting these base criteria will require a more detailed review addressing those areas in which the criteria are not met.

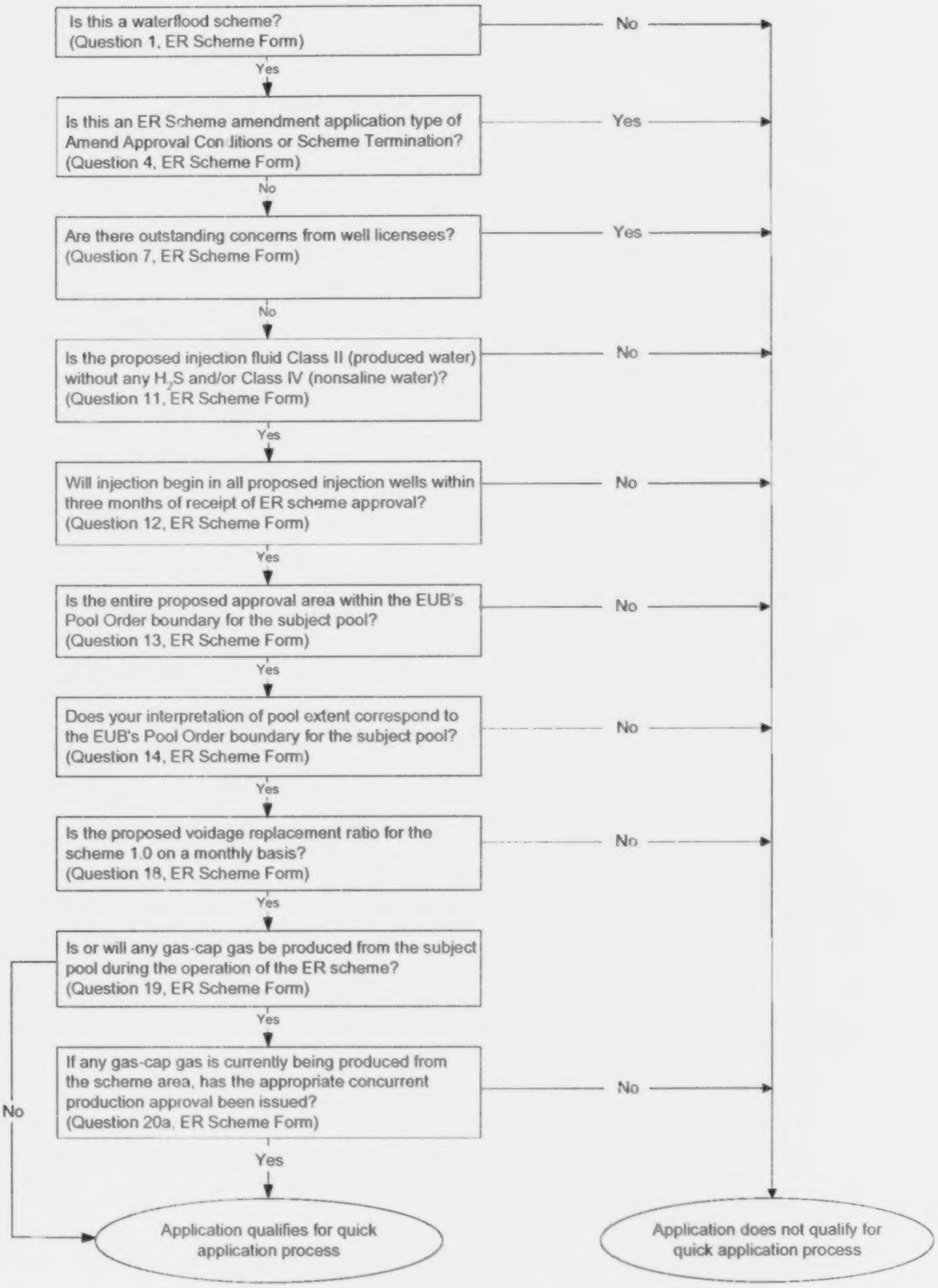
Is this a waterflood scheme?
(Question 1, ER Scheme Form)
No
Yes
Is this an ER Scheme amendment application type of Amend Approval Conditions or Scheme Termination?
(Question 4, ER Scheme Form)
Yes
No
Are there outstanding concerns from well licensees?
(Question 7, ER Scheme Form)
Yes
No
Is the proposed injection fluid Class II (produced water) without any H2S and/or Class IV (nonsaline water)?
(Question 11, ER Scheme Form)
No
Yes
Will injection begin in all proposed injection wells within three months of receipt of ER scheme approval?
(Question 12, ER Scheme Form)
No
Yes
Is the entire proposed approval area within the EUB's Pool Order boundary for the subject pool?
(Question 13, ER Scheme Form)
No
Yes
Does your interpretation of pool extent correspond to the EUB's Pool Order boundary for the subject pool?
(Question 14, ER Scheme Form)
No
Yes
Is the proposed voidage replacement ratio for the scheme 1.0 on a monthly basis?
(Question 18, ER Scheme Form)
No
Yes
Is or will any gas-cap gas be produced from the subject pool during the operation of the ER scheme?
(Question 19, ER Scheme Form)
No
Yes
If any gas-cap gas is currently being produced from the scheme area, has the appropriate concurrent production approval been issued?
(Question 20a, ER Scheme Form)
No
Yes
Application qualifies for quick application process
Application does not qualify for quick application process

Figure 2.1. Decision Tree for Quick Enhanced Recovery Application Process

The EUB will issue its disposition on ER scheme applications electronically, with the disposition being available for viewing through IAR Query for 30 days after the disposition of the application. IAR Query is accessible via the Applications page on the EUB's Web site. It will take the EUB longer to issue a decision on nonelectronic applications.

If ER operations involve any hydrogen sulphide (H_2S) injection and an emergency response plan (ERP) is required, the ERP must be approved prior to the ER scheme approval being issued. ERPs are approved and reviewed for compliance by the EUB Operations Group. See *Guide 71: Emergency Preparedness and Response Requirements for the Upstream Petroleum Industry* for further details on emergency response planning. In addition, if an injection fluid contains H_2S, all pipelines and facilities associated with the scheme must be approved for the appropriate sour service as per *Guide 56: Energy Development Applications and Schedules*.

Pool delineation differences that are pertinent to the ER scheme design must be resolved by a separate pool delineation application, in accordance with Section 2.5 of this directive, prior to the submission of an ER scheme application. An exception may be if the proposed approval area is larger than the Pool Order boundary due to wells not yet evaluated by the EUB.

2.1.1.3 Other Issues

A) Allowable Administration

For oil pools on maximum rate limitation (MRL) administration, upon approval of a new ER scheme or ER scheme amendment, good production practice (GPP) will normally be granted to the wells within the approval area provided that injection will begin within three months of the approval date. If injection is not scheduled to begin within three months, the EUB may decide to grant GPP after written notification to the EUB that injection has commenced. Wells outside of the approval area will normally remain on MRL.

If granted, with the condition that injection will begin within three months, GPP will be effective concurrent with the ER approval. Wells must not produce above their MRL prior to GPP being granted. With the granting of GPP before confirmation that injection has commenced, the EUB expects operators to prudently produce their wells pending the successful implementation of ER.

For oil pools on GPP administration, upon approval of a new ER scheme or ER scheme amendment, GPP will normally be retained for wells within the approval area. For wells outside the ER approval area, the EUB may require the well licensees to address ER feasibility and the appropriateness of continued GPP status.

B) Wellbore Integrity and Completion Requirements

Wellbore integrity requirements, detailed in EUB *Guide 51: Injection and Disposal Wells—Well Classifications, Completions, Logging, and Testing Requirements*, will now be administrated through the EUB Operations Group and will occur outside of the ER application process. All submissions relating to the requirements of *Guide 51* should be sent to the EUB Operations Group for review and approval. The ER application disposition documents (approval and letter) will no longer incorporate the *Guide 51* approval. The *Guide 51* requirement documents may be submitted either in advance of or following submission of the ER scheme application, but injection may not begin until after written confirmation that both the ER scheme application has been approved and the *Guide 51* requirements have been met.

The EUB specifies a deadline for injection to begin in the ER approval. If you cannot meet the *Guide 51* requirements and begin injection prior to the specified deadline, you must submit an ER amendment application (Amend Approval Conditions) addressing the anticipated commencement of injection and the reason(s) for the delay. If the *Guide 51* requirements are not met prior to the specified injection deadline, the EUB may rescind the approval or portion thereof.

C) Reserves

The EUB sets ER reserves outside of the ER scheme application review process. A nominal level of reserves information is required in all ER scheme applications, with more detail possibly being required for applications involving more complex ER processes. The processing of ER scheme applications will not be delayed to conduct a detailed review of reserves, but ER reserves will be set as early as possible following approval of an ER scheme. Approval holders may be required to provide additional information regarding reserves outside the application review process.

Reserves changes are not communicated directly to companies, but EUB reserves values are available upon request through Information Services. Any changes to the rate administration of wells due to reserve changes are reflected in the monthly MRL order.

D) Use of Nonsaline Water

The EUB supports the water management objectives of Alberta's *Water for Life: Alberta's Strategy for Sustainability* and the reduction plans outlined in the *Advisory Committee on Water Use Practice and Policy Final Report*. In this regard, applicants proposing to use nonsaline water in an ER scheme must obtain prior approval from Alberta Environment (AENV) under the *Water Act* for the diversion of the nonsaline water. This approval must be obtained before submitting an application for an ER scheme to the EUB. AENV requires applicants for water diversion to fully investigate alternatives and submit evidence showing that there are no practical alternative saline water sources. For information on a water diversion application, please contact the regional offices of AENV.

2.1.2 EUB Requirements and Expectations for ER Schemes

The EUB's objective in regulating ER schemes is to ensure that hydrocarbon recovery is optimized. In meeting this objective, the EUB must also ensure that scheme operations are conducted in a safe manner that is in the best interest of the public, protects the environment, and is equitable to other well licensees.

2.1.2.1 Scheme Requirements

Scheme requirements are those rules that must be met and against which the EUB will take enforcement action in cases of noncompliance. In addition to all other requirements of the *Oil and Gas Conservation Act* and *Regulations*, the following are some specific requirements for all ER schemes:

- The approval holder is responsible for the successful operation of an ER scheme.
- Approval holders must comply with all conditions of ER approvals.
- The holder of the ER approval must be the current operator of the scheme.
- Injection must not begin in a well until after written confirmation that both the ER scheme application has been approved and *Guide 51* requirements have been met.

- Gas-cap gas production requires EUB approval for concurrent production.
- The type of ER scheme (e.g., waterflood, miscible flood, gas cycling) must be selected to maximize recovery.
- The type of injection fluid must be selected to maximize hydrocarbon recovery.
- All ER schemes must be operated in a manner that optimizes hydrocarbon recovery.
- The injection fluid must be compatible with the reservoir rock and reservoir fluid.
- The supply of injection fluid must be capable of maintaining the specified scheme voidage replacement.
- Injection wells and injection intervals must be located in such a manner that optimizes both areal and vertical sweep efficiency.
- The proposed approval area must reflect the area that will be effectively swept by the injection wells and must conform to the EUB-approved spacing.
- The approval will list only existing injection well locations, not those planned at some future date.
- The holder of an ER approval must comply with *Guide 51*. Injection pressures must remain below the approved maximum wellhead injection pressure at all times.
- Gas must be conserved in accordance with *Guide 60: Upstream Petroleum Industry Flaring Guide*.
- If an ERP is required for the injection of H_2S, an up-to-date EUB-approved ERP must be in place.
- The ER scheme approval area will not extend beyond the EUB's Pool Order boundary for the subject pool.

2.1.2.2 Scheme Expectations

Although optimal operating practices may vary for each reservoir, there are fundamental principles and practices that the EUB expects to be followed, in addition to the above-noted requirements, for all ER schemes. EUB expectations on how ER schemes should be assessed, designed, implemented, and operated are described below.

A) Assessment Stage

- For all pools, including those that are on GPP, the feasibility of ER should be reviewed on an ongoing basis.
- For retrograde gas condensate pools, the feasibility of gas cycling should be evaluated before reaching the dew point pressure in order to maximize recovery.
- Well licensees should collect the appropriate reservoir data necessary to accurately assess ER potential.
- ER should normally be evaluated and, if feasible, implemented in oil pools prior to production of the gas cap.
- Pool delineation should be well understood prior to designing and implementing an ER scheme.
- The applicant should have a good understanding of the reservoir and fluid properties prior to designing the ER scheme.

B) Design Stage

- In waterfloods, produced water should be reinjected.
- Production wells that are second or third line offset from injection wells should be included in the proposed scheme only when it is anticipated that the proposed injection wells will be able to provide adequate sweep and pressure support.

C) Implementation Stage

- Injection operations should be initiated at the optimal time. Injection should begin before the reservoir pressure drops below the bubble point pressure in oil pools or the dew point pressure in the case of retrograde gas condensate pools.
- Injection operations in all approved injection wells should begin as soon as possible. In most cases, the EUB will specify a deadline for the commencement of injection of three months from the date of the approval or amendment.

D) Operations

- If there are multiple well licensees within the approval area, the approval holder is expected to coordinate the scheme operations to ensure that maximum recovery is attained.
- All well licensees in the approval area are expected to adhere to the approval conditions.
- Well licensees should collect the appropriate reservoir data necessary to accurately assess an ER scheme and optimize scheme performance.
- Alternatives to nonsaline water injection should be assessed on an ongoing basis.
- The entire approval area should have a uniform voidage replacement and pressure distribution.
- Where feasible and appropriate, the ER scheme should be operated at a reservoir pressure close to the bubble point pressure or dew point pressure.
- To provide operating flexibility, an ER approval does not need to be amended to remove wells that have ceased injection.
- Well licensees are expected to prudently produce their wells pending the successful implementation of ER.
- ER schemes should be monitored and adjustments or changes made to ensure optimum recovery.

2.1.3 Requirements for ER Scheme Applications

2.1.3.1 Requirements That Must Be Met Before an ER Application May Be Submitted

An ER application may be submitted to the EUB once the following requirements have been met:

- The primary applicant[*] has obtained the right to represent all well licensees within the proposed approval area.
- The primary applicant has notified all well licensees in accordance with the requirements in Section 2.1.3.2.
- The proposed injection wells have been drilled.

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[*] A primary applicant is a company, other than a consulting company, that is submitting an application to the EUB.

- The source of the proposed injection fluid has been secured.
- There are no differences between the applicant's and the EUB's interpretation of pool delineation that are pertinent to the ER scheme.
- For a scheme amendment, the primary applicant is the approval holder.

2.1.3.2 Notification Requirements for ER Scheme Applications

An applicant must provide proper notification, including scheme details such as approval area, type of ER scheme, and injection well locations, to all well licensees in accordance with the following requirements. Notification must be provided a minimum of 10 days prior to submission of the application to the EUB. Failure to complete notification as required may result in an application being closed without being processed.

Minimum Notification Requirements

Applicants for enhanced oil recovery (EOR) schemes (new and amendment) must notify, as a minimum,

- licensees of wells that are completed in the pool and are within the proposed approval area,
- licensees of wells that are completed in the pool and are within 800 metres (m) of the proposed injection well(s), and
- for new EOR schemes, licensees of wells that are completed in the pool and are within a quarter section of the proposed approval area.

Applicants for gas cycling schemes (new and amendment) must notify, as a minimum,

- licensees of wells that are completed in the pool and are within the proposed approval area, and
- for new gas cycling schemes, well licensees that are within a section of the proposed approval area.

Special circumstances, such as pressure communication between pools through a common aquifer, may require notification beyond the minimum requirements.

Licensees of abandoned wells do not need to be notified.

The EUB expects well licensees to act in the best interest of all parties with an interest in a well, including lessees and lessors, particularly in cases of mixed ownership within the proposed approval area.

Applicants must retain the list of well licensees notified regarding the proposed scheme/amendment, the notification document, the date of notification, and any responses or comments received. This information is not required to be submitted as part of the ER application unless there are unresolved licensee concerns. In this case, a Licensee Concerns attachment must be included.

2.1.3.3 Forms and Attachments Required for ER Scheme Applications

A) Summary of Required Application Documents

All ER scheme applications must include

- Resources Applications Schedule 1

- ER Scheme application form (Appendix I),
- Attachments
  - Application
  - Approval Area Map
  - Pressure-Volume-Temperature (PVT) Data
  - Reserves Data
  - Licensee Concerns (if there are any unresolved concerns)
  - Isopach Map (for new ER schemes and significant area amendments)
  - Well Log(s) (for new ER schemes and significant area amendments)
  - Pressure Data and Interpretation (for new ER schemes and significant area amendments)
  - Structure Map (for new gas cycling schemes)
  - Miscellaneous (additional information to support the request)

Further explanation on the ER Scheme application form and attachments is provided in the following sections (B) and (C).

B) Explanatory Notes for ER Scheme Application Form Questions

The ER Scheme application form is in Appendix I. The numbering below corresponds to the questions on the form.

Application Type

1) Type of ER scheme being proposed or amended.

Only one type of ER scheme may be selected. Although schemes may have multiple types of injection fluid, there generally is a predominant recovery mechanism or scheme type. For example, a scheme with water-alternating-gas (WAG) injection is a miscible scheme even though solvent, water, and gas would be injected during the scheme's life.

If you choose Other, you must include a description of the ER process and supporting technical documents/papers discussing the method in the application.

2) Is this application for a new ER scheme or an amendment to an existing ER scheme approval?

If an EUB approval for ER does not exist for the subject scheme, select New.

If an EUB approval for ER exists for the subject scheme, select Amendment.

3) What is the existing EUB approval number proposed for amendment?

If the application is for an amendment to an existing ER scheme approval, enter the current approval number without alpha characters.

4) Type of Amendment:

If the application is for an amendment to an existing ER scheme approval, the type of amendment must be selected. Multiple amendment types may be selected, with the exception of "Scheme termination," which must be a singular ER scheme amendment type.

Add injection well location(s): Select this box if you are requesting approval to add one or more injection well locations to the approval.

Amend approval area: Select this box if you are requesting a change to the current approval area (shown in the appendix to the approval). The proposed approval area should reflect the area that will be effectively swept by the injection wells and should conform to the EUB-approved spacing.

Amend approval conditions: Select this box if you are requesting to change a condition of the approval. For example, this could include changes to the minimum operating pressure or voidage replacement requirements, but not a change to the holder of the approval.

Scheme termination: Select this box if you are requesting approval to rescind the ER approval.

Ownership and Notification Information

5) *The primary applicant must*
   a) *be the proposed approval holder for a new scheme or the current approval holder for an existing scheme, and*
   b) *represent all well licensees in the proposed approval area.*

   Have these requirements been met?

YES means that both of these requirements have been met and the primary applicant accepts responsibility for compliance with all conditions of the approval.

NO means that one or both of these requirements have not been met, and as a consequence the application may not be submitted. Any request to change the approval holder must be made in accordance with Unit 5 of this directive.

6) *An ER scheme application cannot be submitted until notification of all well licensees has been completed in accordance with* Directive 65.

   Has notification been completed in accordance with Directive 65*?*

YES means that the notification requirements specified in Section 2.1.3.2 have been met.

NO means that these requirements have not been met. An ER scheme application may not be submitted until these requirements have been met.

7) *Are there outstanding concerns from well licensees? If yes, the Licensee Concerns attachment must be submitted as part of the application, in accordance with* Directive 65.

YES means that there are unresolved concerns or objections from one or more of the well licensees that were notified of the application. The information required in a Licensee Concerns attachment is identified in Section 2.1.3.3(C) of this directive.

NO means that there are no known unresolved well licensee concerns from any of the well licensees that were notified of the application.

Proposed Injection Well Locations and Injection Intervals

This section must only be completed for new ER schemes and amendment types requesting to add injection well location(s).

8) An ER scheme application cannot be submitted unless the proposed injection wells have been drilled.

Have the proposed injection wells been drilled?

YES means that all the proposed injection wells have been drilled.

NO means that all the proposed injection wells have not been drilled. The EUB is not prepared to accept an ER application when the proposed injectors are not drilled because of the potential this creates for changes to the scheme details (commencement of injection date, bottomhole location of injector, and the unconfirmed presence and quality of the reservoir).

9) An ER scheme application cannot be submitted unless the source of the proposed injection fluid has been secured.

Has the source of the proposed injection fluid been secured?

YES means that the supply of injection fluid is secured and will be available for use by the proposed injection date.

If nonsaline water is to be used for injection, you must have a valid water diversion permit from Alberta Environment. The water diversion permit number must be provided in the Application attachment.

NO means that the injection fluid source has not been secured. The EUB is not prepared to accept an ER application when the injection fluid has not been secured because of the potential for delays in the commencement of injection.

10) Provide the following for the proposed injection well locations:

Well Licence Number: The well licence number issued by the EUB for the proposed injection well.

Unique Well Identifier (UWI): the UWI (LE/LSD-SEC-TWP-RGEWMER/ES) associated with the Well Licence Number. The full unique well identifier is listed in the approval; it is important to enter the correct identifier. If the event sequence is not known or available, enter the “0” event and note this uncertainty in the Application attachment.

Injection Interval: The top and base depth of the injection interval.

Porosity Interval: The porosity top and porosity base depth of the reservoir proposed for injection.

Fluid Interface: The current gas/oil and oil/water depths (if applicable) in the reservoir proposed for injection. These depths may be measured or estimated.

11) What type of injection fluid, as identified by Guide 51, *will be used?*

Multiple injection fluids may be selected. Further descriptions of the injection classes are in *Guide 51*.

11a) If an injection fluid contains H_2S and an emergency response plan (ERP) is required, the EUB must ensure that an up-to-date ERP is in place prior to its decision on the application.

Is an EUB-approved ERP incorporating the proposed scheme in place?

If no, a discussion addressing the status of the ERP must be included in the Application attachment, in accordance with Directive 65.

There are additional environmental and safety concerns that need to be addressed when the injection fluid contains any H_2S. Therefore, the EUB must ensure that the need for the ERP has been addressed and if one is required that the EUB Operations Group has approved an ERP that encompasses the proposed scheme prior to making a decision on an application.

YES means that an EUB-approved ERP incorporating the proposed scheme is in place.

NO means that either an EUB-approved ERP incorporating the proposed scheme is required but not in place or that an ERP is not required. For either situation, an explanation must be provided.

ERPs should be forwarded directly to the EUB Operations Group for review. See *Guide 71* for further details on emergency response planning.

12) Will injection commence in all proposed injection wells within three months of receipt of approval?

If no, a discussion addressing the anticipated commencement of injection and the reason for the delay must be included in the Application attachment, in accordance with Directive 65.

YES means that injection will begin within three months of the date of approval. This commencement of injection date will be a condition of the approval.

NO means that injection will not begin within three months of receipt of approval. Provide reasons for the delay in the commencement of the injection date beyond the standard three-month period. If injection will not begin within three months, the EUB will generally not grant GPP at the time of the ER approval due to conservation concerns. The EUB may decide to grant GPP after written notification to the EUB that injection has begun.

Proposed Approval Area

This section must only be completed for new ER schemes and amendment types requesting to amend the approval area.

13) Is the entire proposed approval area within the EUB's Pool Order boundary for the subject pool?

YES means that the entire proposed approval area is within the EUB's current Pool Order boundary for the subject pool.

NO means that the proposed approval area extends beyond the EUB's current Pool Order boundary for the subject pool. The EUB cannot approve ER approval areas larger than the Pool Order boundary. Differences in pool delineation should be addressed prior to submission of the ER application. Note that the approval area will not include injectors without hydrocarbon pay, but such injectors may be listed in the approval.

The EUB's Pool Order boundaries are on the EUB's Web site under the Board Order System (BOS) at www.eub.gov.ab.ca/BBS/orders/bos/bos.htm.

14) Does your interpretation of pool extent correspond to the EUB's Pool Order boundary for the subject pool?

YES means that your interpretation of pool extent coincides with the area identified by the EUB's current Pool Order boundary for the subject pool.

NO means that your interpretation of pool extent does not coincide with the area identified by the EUB's current Pool Order boundary for the subject pool.

The EUB's Pool Order boundaries reflect quarter section for wells with oil pay and one section for wells with gas pay.

15) Is the difference in pool delineation interpretation pertinent to the proposed ER scheme, in accordance with Directive 65*?*

Provide a discussion of the difference in pool delineation and the pertinence to the proposed ER scheme in the Application attachment, in accordance with Directive 65.

A difference in pool delineation is considered pertinent if it affects any of the following aspects of the proposed ER scheme: approval area, approval conditions, notification, or approved injection wells.

Pool delineation is very important to the EUB's review of any ER scheme. The assessment of the effectiveness of the proposed scheme relative to the optimal depletion strategy for the entire pool requires that overall pool delineation be known. Also, accurate pool delineation is necessary to allow for the identification of possible equity concerns involved with the proposed ER scheme.

YES means that your pool interpretation differs from that of the EUB in a manner that could impact the ER approval. Significant differences in pool delineation must be dealt with in advance of making an ER scheme application. However, an exception may be where the proposed approval area is larger than the Pool Order boundary due to wells not yet being evaluated by the EUB.

NO means that your pool interpretation differs from that of the EUB in a manner that does not impact the ER approval. For example, the recognized differences are significantly outside of the proposed approval area.

If the proposed approval area extends beyond the EUB's Pool Order boundary for the subject pool or your interpretation of pool extent does not coincide with the EUB's Pool Order boundary for the subject pool, an explanation of the difference and a discussion of why this difference is not pertinent to the proposed ER scheme must be provided.

Scheme Details

16) Is the scheme area currently administered under good production practice (GPP)?

YES means that all of the wells within the proposed approval area have been granted GPP.

NO means that some or all of the wells within the proposed approval area are subject to a prescribed maximum rate limitation (MRL) or that the proposed scheme is in a gas pool.

A copy of the most recent MRL Order can be found on the EUB's Web site at www.eub.gov.ab.ca/BBS/orders/mrl/MRL_Order.htm.

17) Will produced gas from the ER scheme area be conserved, in accordance with Guide 60 *requirements?*

The EUB expects that gas conservation in accordance with *Guide 60* is occurring. See *Guide 60* for further information.

18) What is the proposed voidage replacement ratio (VRR), on a monthly basis, for the scheme?

> *The EUB normally specifies a VRR of 1.0 to fully maintain reservoir pressure. If the VRR will not be 1.0, provide a technical justification in the Application attachment, in accordance with* Directive 65.

Specify the proposed monthly VRR for the scheme. The VRR should reflect the injection into and production from the total scheme area. Technical justification for a VRR other than 1.0 must be provided, along with the reason(s) for the over- or under-injection and its impact on scheme recovery. The EUB will normally specify a VRR as a condition of the approval.

19) Is or will any gas-cap gas be produced from the subject pool during the operation of the ER Scheme?

> *If yes, include a discussion on the potential for fluid migration into the gas cap in the Application attachment, in accordance with* Directive 65.

YES means that gas-cap gas is or will be produced from the pool, either within or outside of the scheme area, during the period that the ER scheme is operational.

If any gas-cap gas is or will be produced from the subject pool during the operations of the ER scheme, provide a discussion on the potential for fluid migration from the scheme into the gas-cap and pressure depletion in the scheme due to gas-cap gas production. If potential for fluid migration or pressure depletion is identified, the discussion should include the impact on ultimate hydrocarbon recovery.

NO means either that there is no associated gas cap in the pool or that the associated gas cap will not be produced during the period that the ER scheme is operational.

20) Is gas-cap gas currently being produced from the scheme area?

YES means that an associated gas cap is present in the pool and this gas is currently being produced from the scheme.

NO means that an associated gas cap is present in the pool but this gas is not currently being produced from the scheme.

20a) Has the appropriate concurrent production (CCP) approval been issued?

If Question 20 is answered yes, gas-cap gas is currently being produced from the scheme area and this question must be answered.

YES means that the appropriate form of concurrent production that encompasses the current gas-cap gas production has been approved by the EUB. The CCP approval details are listed in the EUB's MRL Order.

NO means that the current gas-cap gas production has not been approved by the EUB.

20b) An application for CCP is required. Has an application for CCP been registered?

If Question 20a is answered no, the current gas-cap gas production has not been approved by the EUB and this question must be answered.

YES means that an application for CCP has been registered with the EUB.

NO means that an application for CCP has not yet been registered with the EUB. Unauthorized CCP is not permitted; an application for CCP is required pursuant to Section 39(1)(f) of the *Oil and Gas Conservation Act* and Section 2.4 of this directive.

20c) If yes, provide the CCP application number.

If Question 20b is answered yes, an application for CPP has been registered with the EUB and this question must be answered.

If an application for CCP has been registered, enter the EUB application number. Information details on applications registered with the EUB are on the EUB's Web site at www.eub.gov.ab.ca/BBS/applications/IAR/iar.htm.

C) Explanatory Notes for ER Scheme Application Attachments

Application Attachment

A text attachment providing a description of the proposed scheme that includes:

1) the proposed injection pattern,

2) the expected sweep efficiencies (e.g., vertical, areal)

3) the displacement type (e.g., bottom water drive, horizontal),

4) the measures taken to prevent channelling and to maximize the swept reservoir volume,

5) the proposed date of commencement of injection,

6) the approximate date when the proposed VRR will be achieved, and

7) the type, composition, and source of the injection fluid, including chase gas for miscible floods. For changing injection fluid compositions, provide the anticipated range of compositions; for nonsaline water injection, provide the water diversion permit number.

8) If an injection fluid contains any H_2S and an ERP is required, a statement that an up-to-date ERP incorporating the proposed scheme is in place or a discussion addressing the status of the ERP update. If an EUB-approved ERP is not required for the proposed scheme as per *Guide 71* requirements, an explanation of why an ERP is not required.

9) If all of the proposed injection wells will not begin injection within three months of the approval date, include a discussion addressing the anticipated commencement of injection for each injection well and the reason for the delay.

   On-injection dates of up to six months from the date of approval may be considered by the EUB with sufficient justification, but the EUB will review and decide on each such application.

10) If your interpretation of pool delineation is different than the EUB's interpretation, as reflected by the current Pool Order boundary, include a discussion of the difference in pool delineation and why the difference is not pertinent to the proposed ER scheme. In cases where wells in the proposed scheme area have not yet been evaluated by the EUB, the wells requiring review should be identified.

11) If the proposed Voidage Replacement Ratio (VRR) is not 1.0 on a monthly basis, provide technical justification for a VRR other than 1.0, including the reason(s) for the over- or under-injection and its impact on scheme recovery. For example, if partial pressure maintenance is provided by an associated aquifer, include detailed analysis to show that the proposed VRR in combination with the aquifer will maintain reservoir pressure.

12) If any gas-cap gas is or will be produced from the subject pool during the operations of the ER scheme, provide a discussion on the potential for fluid migration from the scheme into the gas-cap and pressure depletion in the scheme due to gas-cap gas production. If potential for fluid migration or pressure depletion is identified, the discussion should include the impact on ultimate hydrocarbon recovery.

13) If any gas-cap gas is currently being produced from the proposed scheme area and the appropriate concurrent production approval does not exist, provide a discussion of your plans to submit a concurrent production application.

Approval Area Map Attachment

Map(s) showing

1) the EUB's current Pool Order boundary for the subject pool (www.eub.gov.ab.ca/BBS/orders/bos/bos.htm),

2) the location and current status (indicated by well symbols) of each well

- within the proposed approval area and
- within the notification area specified in Section 2.1.3.2,

with wells completed in the pool highlighted,

3) the outline of other existing ER recovery scheme approval areas within the pool that offset the subject scheme, and

4) for a **new ER scheme**, include the applied-for approval area, and
   for an **ER amendment application,** include the current approval area and any proposed areas of amendment and the zero edge of the pool.

The proposed approval area must reflect the area anticipated to be swept by the scheme injectors and should conform to the EUB-approved drilling spacing units.

For clarity, the information may be provided on separate maps.

For very large pools, the map should focus on the region in and surrounding the scheme area.

For a new scheme, the net oil/gas pay isopach map(s) must be provided as a separate attachment. For scheme amendments, the pool zero edge in the region of the proposed scheme area must be provided.

PVT Data Attachment

Pressure-volume-temperature (PVT) properties, including

1) the initial reservoir pressure,
2) the proposed operating pressure of the scheme,
3) the current average reservoir pressure within the scheme area,
4) the saturation (bubble point) pressure,
5) the reservoir temperature,
6) the B_{oi}, B_{gi} (if applicable), R_{si}, and B_{wi} values,
7) the B_o, B_g, R_s, and B_w values at the current average reservoir pressure within the scheme area, and
8) the source of the PVT data.

For gas cycling schemes, substitute the dew point pressure for item (4), and the full constant volume depletion analysis of the reservoir fluid for items (6) and (7).

All data must be in metric units.

Along with the stage of reserves recovery, the value of the bubble point or dew point relative to the current and proposed operating pressures is an important consideration when evaluating an ER scheme.

Reserves Data Attachment

Estimates of the oil and gas reserves, including

1) the initial oil and gas volumes in place for the ER scheme area,

2) the oil and gas recovery factors under the existing depletion mechanism and under the proposed ER scheme,
3) the recoverable oil and gas reserves for the scheme area,
4) the reservoir area, average net pay, average porosity, and average water saturation for oil and gas in the scheme area,
5) a description of the methods used in determining the estimates for (1) and (2) above (e.g., material balance, volumetric analysis, model study, a comparison of analog pools, and sweep and displacement efficiencies), and
6) for gas cycling schemes, the initial propane, butane, and condensate in place converted to liquid volumes.

A fundamental service that the EUB provides to all stakeholders is maintaining reserve estimates for all pools in Alberta.

A nominal level of reserves information is required in ER scheme applications, and more detail may be required for applications involving more complex ER processes. As well, additional information may be requested during the application review, after approval, or during a future audit.

Licensee Concerns Attachment

If there are any unresolved concerns from a well licensee, provide an attachment that includes the following:

1) contact information for the well licensee that has unresolved concerns/objections,
2) a copy of the notification letter provided to the well licensees,
3) a list of any other documents distributed,
4) a copy of written concerns and objections received, or if not available, a summary of issues,
5) a chronology of any discussions conducted with the well licensee(s),
6) a discussion of how the applicant would like the EUB to proceed with the application, and
7) any steps taken to mitigate the unresolved concerns and objections and the applicant's response to the concerns.

Isopach Map Attachment (for new ER schemes and significant area amendments)

An isopach map of net oil and/or gas pay showing

1) location of the initial fluid interfaces (gas-oil, gas-water, oil-water), and
2) location and current status (indicated by well symbols) of each well within and offsetting the proposed approval area.

The EUB requires the geological extent and hydrocarbon pay thickness of a pool, any fluid interfaces, and well control with statuses to assess how the proposed scheme relates to optimum pool depletion, other existing schemes, and potential pool delineation and equity issues.

For very large pools, the map should focus on the region in and surrounding the scheme area.

Well Log(s) Attachment (for new ER schemes and significant area amendments)

An interpreted and annotated log cross-section or representative well log(s) showing

1) stratigraphic interpretation of the zone(s) of interest,
2) interpretation of fluid interfaces (original and current, if applicable),
3) completion and treatments to the wellbore(s), with dates,
4) cumulative production,
5) finished drilling date and kelly bushing (KB) elevation, and
6) the scale of the log readings.

This cross-section may be presented in a number of ways—as one representative well log, several well logs, or a detailed cross-section of the entire pool—depending on the complexity and heterogeneity of the pool. The information on this cross-section assists in establishing the vertical continuity within the pool and the overall quality of the pool.

Pressure Data and Interpretation Attachment (for new ER schemes and significant area amendments)

Reservoir pressure data, including

1) measured or estimated reservoir pressures for the scheme area,
2) the source of the data, and
3) a discussion of how the pressure data relates to and supports the scheme operations.

The applicant must include all pressure data available for scheme wells. The data may be presented in various formats, such as a pressure-time plot, an isochronal map, or a table illustrating the pressures for the scheme wells. Pressure data should be corrected to the EUB-established pool datum.

All pressure data must be in metric units.

Reservoir pressure data are a key component to ensure the success and optimal operation of ER schemes. Taking timely and representative reservoir pressure measurements assures that the necessary information is available to help monitor and optimize scheme performance. All new ER schemes will be added to the annual pressure survey schedule unless otherwise stated.

Structure Map Attachment (requirement for new gas cycling schemes)

A structure map of the subject pool clearly identifying interpreted fluid interfaces (current and original, if applicable), stratigraphic horizon, and contoured surface (porosity top or formation top).

If the proposed ER scheme is for a gas cycling scheme or an ER scheme where vertical displacement is important to evaluating the scheme design, a structure contour map must be provided.

D) Additional Requirements for ER Scheme Amendment Applications

The requirements listed in this section are supplemental to the mandatory requirements and vary according to the type of amendment.

Add Injection Well Location(s)

Provide a technical explanation of why the additional injection location(s) are required and how they are consistent with the optimal depletion strategy to ensure that hydrocarbon recovery is maximized from the scheme area.

Amend Approval Area

Provide a written description of and technical justification for the proposed changes to the approval area. For a significant expansion to the area of an existing scheme, the EUB requires the isopach map, well log(s), and pressure data and interpretation attachments.

Amend Approval Conditions

Provide the specific details of and technical justification for the proposed changes to the approval conditions.

Scheme Termination

An application to rescind an ER approval is required to terminate an ER scheme. Generally, termination of the scheme involves ceasing all injection.

An application to rescind an ER approval must include

1) a discussion of the reason(s) for termination of the scheme, including how the pressure and production performance justifies the request for termination;
2) a detailed economic analyses to show that continued injection is uneconomic—the EUB may request further economic justification for scheme termination in certain cases;
3) a discussion of other scenarios, apart from ceasing injection completely, that were considered—for example, partial pressure maintenance, well recompletions, or workovers;
4) a discussion of the future depletion strategy for the approval area and the remaining recoverable reserves; and
5) a discussion of the success of the ER scheme, including the details of the actual incremental volumes by recovery mechanism (e.g., primary, waterflood, gas cycling, miscible flood).

E) Additional Requirements for Miscible Flood Scheme Applications

The requirements listed in this section are supplemental to the mandatory requirements and are specific to new miscible flood schemes. Amendments to existing miscible flood schemes should only address the requirements necessary to justify the request.

An application for a new miscible flood scheme must include

1) proof of miscibility with the reservoir oil, which usually requires slim tube or rising-bubble tests over a range of injection fluid compositions and/or pressures to establish the point or boundary of miscibility;

2) the proposed miscibility conditions, as appropriate, from the following:

   a) the minimum miscibility pressure (MMP) at the proposed composition of the injection fluid:

      The MMP is the lowest pressure for which the injection fluid can develop miscibility through a multicontact process with the given reservoir oil at reservoir temperature. To maximize oil recovery, the EUB may specify a minimum operating pressure (MOP) in the approval. The specified MOP will usually be nominally higher than the MMP to incorporate a safety factor for misciblility.

   b) a correlation of injection fluid composition versus operating pressure,

   c) the minimum pseudo-critical temperature of the injection fluid and MOP,

   d) the minimum C2+ content of the injected fluid and MOP, and

   e) other conditions to ensure misciblility;

3) for water alternating gas (WAG) schemes, the proposed WAG ratio target and range and WAG cycle, along with the technical justification; and

4) the methodologies proposed to be used to determine when injection fluid breakthrough occurs and to calculate the volumes of injection fluid breakthrough. Fluid sampling and analysis for miscible flood (MF) schemes must follow the requirements specified in *Informational Letter (IL) 92-5: Reduced Fluid Sampling and Analysis for Hydrocarbon Miscible Flood Schemes*, unless otherwise stated in the approval.

F) Additional Requirements for Gas Cycling Scheme Applications

If an operator considers gas cycling appropriate, an application for an ER scheme must be submitted. Amendments to an existing gas cycling scheme should only address the requirements necessary to justify the request. In addition to the requirements for an application for a new ER scheme, an application for a new gas cycling scheme must include

1) the proposed rate of cycling and the cycling period before blowdown commences with supporting technical and economic data;

2) the following historical and forecast annual production under various depletion strategies (including primary depletion, partial gas cycling, and full gas cycling):
   a) raw gas,
   b) sales gas,
   c) individual liquid coproducts, and
   d) sulphur;

This performance information for gas cycling schemes should provide the basis for the economic evaluation used in determining the optimum depletion strategy.

3) the forecast annual gas injection showing the portion of make-up gas versus reinjected gas;

4) the composition of the current gas-cap gas, and the average composition of the injected gas on an annual basis;

5) the estimated liquid and sales gas recovery by the various depletion strategies compared to primary depletion; and

6) economic evaluation used to determine the optimum depletion strategy.

The quantification of natural gas liquids carried in the gas cap is of primary importance to the feasibility of the scheme.

2.1.4 ER Related Processes

2.1.4.1 Reporting Requirements

Progress reports for most ER schemes (waterfloods and immiscible gas floods) were eliminated in EUB *IL 94-13: ERCB Progress Report Requirements – Conventional Enhanced Recovery Schemes.* Reporting is still required in the following situations for ER schemes:

- performance presentations and annual data submissions for active miscible flood schemes, in accordance with EUB *IL 96-2: Progress Report Requirements for Miscible Flood Schemes*,
- progress reports and/or performance presentations for gas cycling schemes,
- reporting required as a condition of an EUB approval or letter, and
- any reporting required as follow-up to EUB audit and surveillance processes, including reserve estimates.

2.1.4.2 Audit, Surveillance, and Enforcement

The EUB will audit all new ER schemes and selected scheme amendments about six months after approval issuance. These audits will be conducted to

- confirm compliance with approval conditions,
- verify that the requirements of *Guide 51* have been met,
- review scheme performance (actual versus predicted) to identify any issues, and
- validate data integrity.

If issues arise, the EUB may request additional information or clarification from the approval holder, take appropriate enforcement action and require corrective measures necessary to protect the oil and gas resource, equity, safety, and the environment.

In addition to the six-month audit, the EUB will conduct surveillance on all provincial ER schemes on an ongoing basis. Random or targeted reviews may be conducted to ensure that compliance is met and that performance is consistent with expectations. If compliance or performance issues are identified, the EUB will take appropriate enforcement action and require the approval holder to implement corrective measures.

The EUB's current enforcement actions regarding ER schemes are described in *Interim Directive (ID) 2000-5 Attachment 2: Surveillance and Enforcement for Resource Applications and Approvals* and *IL 99-4: EUB Enforcement Process, Generic Enforcement Ladder, and Field Surveillance Enforcement Ladder.*

2.4 Application for Concurrent Production

2.4.1 Background

Concurrent production (CCP) is defined as the production of an oil accumulation and its associated gas cap at the same time. Section 39(1)(e) of the Oil and Gas Conservation Act requires that no concurrent production scheme may proceed unless approved by the EUB. CCP is a poolwide depletion decision requiring equitable treatment of all participants with productive wells.

2.4.2 When to Make This Application

If there is a need or desire to produce gas-cap gas either directly via a gas well or indirectly through oil zone perforations, application must be made to the EUB.

CCP approval can take the form of one or more of the following:

- outright CCP that allows for production of gas-cap gas from both oil and gas wells
- CCP where gas may be produced through the oil zone perforations only
- CCP with a maximum gas withdrawal rate
- CCP with a maximum gas-oil ratio (GOR) above which the wells must be shut in
- CCP where only certain wells may be produced
- CCP for specific areas of a pool

2.4.3 Terms of Approval

A CCP application would likely be approved if the EUB is satisfied that

1) gas-cap gas production would have a negligible impact on the ultimate oil recovery from the pool or that gas-cap gas production is unavoidable if oil is to be recovered from a given pool;

2) all gas production is or will be conserved; and

3) all potentially adversely affected parties in the pool agree with the proposed CCP scheme.

2.4.4 Requirements for an Application for Concurrent Production (file 3 copies)

Conservation

Requirements	Comments
1) Your geological interpretation of the pool involved, including	
a) oil and gas net pay isopach maps of the pool,	
b) where pool delineation or fluid interface locations are based on structural interpretation, a structure contour map of the pool and offsetting area,	

Requirements	Comments
c) an interpreted and annotated log cross-section or representative well log(s) showing the	
i) stratigraphic interpretation of the zone(s) of interest,	
ii) interpretation of the fluid interfaces present,	
iii) completions and treatments to the wellbore(s) with dates,	
iv) cumulative production,	
v) finished drilling date and kelly bushing (KB) elevation, and	
vi) the scale of the log readings, and	
d) a tabulation of your interpreted net pay, porosity, and water saturation for each well in the pool, along with the cutoffs, methodology, formulas, and constants used.	
2) If you are applying for CCP through certain wells, a list of the wells proposed for CCP.	
3) A statement of whether you have attempted recompletion efforts to reduce gas-cap gas production. If yes, state the results. If no, explain why not.	Gas cap production from oil wells may be reduced or eliminated by reperforating the well lower in the zone.
4) Your evaluation of the oil and gas reserves for the pool, including	The stage of depletion of the pool may influence the EUB's decision and should be discussed where appropriate.
a) an estimate of the initial oil volume and gas volume in place,	
b) an estimate of the oil and gas recovery factors under the existing depletion mechanism and under the proposed CCP depletion strategy,	
c) a description of the methods used in determining (a) and (b) above (e.g.,	

Requirements	Comments
material balance, volumetric analysis, model study, a comparison of analog pools), and d) the supporting data used in determining (a) and (b) above and the sources of the data (e.g., pressure/volume/temperature (PVT) properties and source, pressure data and source).	
5) An estimate of the current oil in place and gas in place and an estimate of the annual oil and gas production under CCP.	An understanding of the current stage of depletion of the subject pool and the future rate of depletion of the gas cap(s) and the oil zone is key to evaluating the appropriateness of CCP for a pool.
6) An estimate of the gas cap segregation drive index, with supporting data and calculations.	Depending on its size relative to the associated oil pool, a gas cap can be a valuable source of pressure to the pool.
7) A discussion of whether you plan any operational changes for the subject pool (such as infill drilling) and, if so, what they are.	Potential changes to a pool, such as infill drilling, pool expansion, and changes in production operations, can alter a pool significantly, and hence a decision on CCP would be deemed premature.
8) Comments as to the feasibility of enhanced oil recovery and gas cycling if there is a retrograde condensate gas cap in the subject pool.	A request for CCP is premature if enhanced recovery or gas cap cycling are feasible, but have not been implemented, in the pool.
9) Confirmation that all gas will be conserved; if this is not the case, a detailed discussion on the feasibility of gas conservation.	Except in cases where gas production is unavoidable, gas production would not generally be approved in the absence of gas conservation. Your evaluation of gas conservation should use the decision tree and economic decision process set out in EUB *Guide 60*, Sections 2.3 and 2.4. Under full gas conservation, only nonroutine flaring can occur. *Guide 60*, Section 2.6, defines nonroutine flaring at conserving facilities and specifies operational requirements to minimize this flaring.

Requirements	Comments
	Failure to address gas conservation as per *Guide 60* may result in processing delays and deficiency requests.
10) An estimate of the ultimate oil and gas recovery from the subject pool under the status quo and under the proposed CCP.	Approval of CCP is contingent upon the gas production having little or no negative impact on ultimate oil recovery from the given pool.

Equity

Requirements	Comments
1) Documentation identifying notification to the unit operators, approval holders (if applicable), or the well licensees in the EUB-designated pool.	CCP applications often involve complex oil and gas equity issues. Failure to notify others involved in the pool will result in the return of your application.
2) Documentation confirming nonobjection from the above parties or specific details regarding objections or concerns.	

2.5 Application for Pool Delineation and Ultimate Reserves

2.5.1 Background

The EUB establishes pool boundaries (vertically and horizontally) and assigns reserves to all oil and gas pools in Alberta. These are shown in Pool Orders (G Orders), annual reserve publications, and individual well and pool files. Well licensees of new oil wells outside of established G Orders must submit a completed application for a New Well Base Allowable or Base MRL (O-38 form).

The initial oil volume or gas volume in place for new pools is often based on simple building-block assignment areas and wellbore parameters. Initially, recovery factors for new pools may be based on analog pools in the area. Initial delineation reflects early geological and pressure information. As the pools are developed and further well data and performance data are available, delineation and reserves may be adjusted to reflect this new information. Net pay isopach maps, material balance analyses, decline analyses, and analytical and numerical models may take the place of the simple building-block approach. Different pressure trends or new gas/oil or oil/water interface information may alter pool boundaries.

The interpretation of pool reserves and delineation can affect regulatory requirements related to the operation and development of oil and gas pools in Alberta, as well as equity-related issues between operators.

2.5.2 When to Make This Application

Following the initial well assignment and if additional information becomes available that substantially changes current decisions, a well licensee may choose to, and in fact is encouraged to, make an application to change assigned reserves or vary pool delineation for several reasons, including

- **conservation** (e.g., New evidence may permit a restricted gas well to produce if it is no longer within a gas cap or the second well in a DSU.)
- **equity** (e.g.: New evidence supports delineation for a well to a pool with a higher MRL or GPP.)
- **future applications** (e.g., While reserves evaluations are required in many other applications in this guide, an applicant may choose to file a stand-alone reserve application. Maintaining a common reservoir information base or understanding differences may assist or accelerate processing future applications for matters addressed in this guide.)
- **provincial records** (e.g., Pool boundaries and reserves are the foundation for conservation and equity protection.)

The EUB monitors pool performance and interprets new well information. As a result, the EUB may also request well licensees to file reserve submissions to update reserves for pools of provincial significance.

2.5.3 How the EUB Processes the Application

Upon receipt of a stand-alone pool delineation or reserve application, the EUB analyzes the new evidence, reviews the applicant's interpretation, and assesses potential alternatives.

These applications are considered a technical information submission, and as such there are no specific requirements to notify and discuss the different interpretations with other well licensees.

The EUB may seek input on the delineation or reserve interpretation from well licensees in the area as part of the overall review. The EUB will consider all input prior to rendering a decision. This decision may not agree with the applicant, who may reapply as additional information becomes available.

2.5.4 Requirements for an Application for Pool Delineation (file 3 copies)

Requirements	Comments
1) The data and your interpretation, if the basis for proposing a pool delineation change is a specific, definitive piece of evidence.	There may be a sharp contrast in performance between wells, such as distinctly different pressure data, that conclusively supports delineation changes. Building-block reserves may be split or adjusted to reflect new boundaries.
2) A detailed reserve submission, if the basis for proposing a pool delineation change is a composite of indicators.	Analysis of a set of data provides for identification of both supporting and refuting elements and a "best fit" decision.

2.5.5 Requirements for an Application for Ultimate Reserves (file 3 copies)

Requirements	Comments
1) Your geological interpretation of the pool, including a) a net pay isopach map of the pool, including both oil and gas if there is an associated pool,	Your application must provide a geological interpretation of the entire pool, not just the portion underlying lands you own. If it will help to clarify your basis for pool delineation or other aspects of your geological interpretation, you should submit a log cross-section containing wells both within and outside of the pool. As a minimum you must submit at least one representative well log from a well in the pool showing the information required in 1(c).

Requirements	Comments
b) where pool delineation or fluid interface locations are based on structural interpretation, a structure contour map of the pool and offsetting area,	
c) an interpreted and annotated log cross-section or representative well log(s) showing the	Your application will have fewer processing delays if you provide a clear picture of your geological interpretation, including the potential for further pool development.
i) stratigraphic interpretation of the zone(s) of interest,	
ii) interpretation of the fluid interfaces present,	
iii) completions and treatments to the wellbore(s), with dates,	
iv) cumulative production,	
v) finished drilling date and kelly bushing (KB) elevation, and	
vi) scale of the log readings, and	
d) a tabulation of your interpreted net pay, porosity, and water saturation for each well in the pool, along with the cutoffs, methodology, formulas, and constants used.	
2) Your evaluation of the oil and gas reserves for the pool, including	If there are sufficient pressure, production, and PVT data, a material balance evaluation should be done and compared to the volumetric results.
a) an estimate of the initial oil volume and gas volume in place,	
b) an estimate of the oil and gas recovery factors,	Failure to provide the calculation methods and supporting data will delay processing of your application.
c) a description of the methods used in determining (a) and (b) above (e.g., material balance, volumetric analysis, model study, a comparison of analog pools), and	It is not necessary to provide production plots for the wells, except to illustrate a particular point or issue (e.g., decline analysis, specific well performance issues)
d) the supporting data used in determining (a) and (b) above and the sources of the data (e.g., pressure/volume/temperature (PVT) properties and source, pressure data and source).	

Unit 3 Production Control

3.1 Application for Commingled Production

3.1.1 Background

The normal practice in accordance with Section 3.060 of the Oil and Gas Conservation Regulations (the Regulations) is to maintain segregation between pools in the wellbore. However, if commingling of production of conventional gas and/or oil from two or more pools in the wellbore is warranted, an application for approval for commingling may be submitted to the EUB under Section 3.050 of the Regulations.

The purposes of maintaining segregation of oil and/or gas in the wellbore are

- to avoid the potential for wellbore and/or reservoir conditions that may adversely affect recovery from pools (for example, in some cases the cross flow of reservoir fluids between pools under a commingled-completion operation may jeopardize recovery from other pools involved), and
- to maintain the ability to gather data on an individual-pool basis for resource evaluation and reservoir management.

3.1.2 When an Application Is Required

Justification for approval of commingling in the wellbore may include

- low deliverability of one or more pools due to reservoir characteristics or depletion of the pool by production,
- small reservoirs that would deplete rapidly under production,
- operational issues that can be handled more effectively with commingled production, such as liquid loading in the wellbore, hydrate formation, or physical limitations in the wellbore (e.g., a casing diameter that is too small to contain two production strings), and
- induced communication behind the casing through a poor cement bond or fracture stimulation.

3.1.2.1 Processes for Obtaining Approval to Commingle Production

A well licensee has two options through which to obtain EUB approval to commingle production from two or more pools in the wellbore. Depending on the circumstances, the well licensee may file a notification form as described in Appendix H of this directive or an application in accordance with Section 3.1.3. In most cases, approval to commingle is granted on a pool, rather than on a well, basis. In addition, if existing approvals for commingling do not address new completions and/or new drilling that are similar in nature to previously applied-for cases, the EUB is prepared to consider applications for the approval of commingling of production on an area basis, provided that the criteria described in Appendix H are met.

3.1.3 Requirements for an Application for Commingled Production (file 3 copies)

Administration

Requirements	Comments
1) A statement of what is being requested, including a) a reference that the application is being made under Section 3.050 of the Oil and Gas Conservation Regulations, and b) the name of the well(s) and pools that are the subject of the application.	
2) A statement of each productive interval (kelly bushing (KB) elevation, in metres) in each well of interest from which you propose to commingle production.	Inclusion of the intervals ensures that there is no confusion about the pools involved, which might occur in some cases where the EUB and an applicant have different terminology for the same zones.
3) A discussion of the reasons why you are requesting commingling.	There must be a solid justification for the request.
4) Where any oil pools are involved, confirmation that the oil pools have a common rate control or, alternatively, an application requesting a change in rate control.	Production from oil pools with different rate control cannot be commingled.

Equity

Requirements	Comments
1) A list of all potentially adversely affected parties (unit operators, approval holders, or well licensees) in any pool involved in the application, together with statements as to whether you have contacted all of these parties respecting the application and, if so, a summary of their views.	Where a pool is subject to unit operations or other approvals, the unit operator or approval holder can in most cases be notified on behalf of the relevant group having an interest in the pool. Otherwise, individual well licensees are the normal target for notification. If you have contacted all potentially adversely affected parties having wells in the pools involved in the application (as determined by the EUB) and can confirm that none of these

Requirements	Comments
	parties has any concerns respecting the application, the EUB will not, except in unusual circumstances, issue a notice of application (i.e., advertise the application). If you have made incomplete or no contact or the view of any party is unclear, the EUB will in most cases proceed with the issuance of notice of application. If a substantiated, valid objection is filed that cannot be resolved by the parties involved in a reasonable time, the EUB will typically schedule a public hearing to consider the matters raised.

Conservation

Requirements	Comments
1) Your interpretation of each pool involved in the application, including	
a) a net pay isopach map of the pool, including both oil and gas if there is an associated pool,	You do not have to include net pay isopach maps if the pools are considered to be single well; however, you should explain why the pools are considered to be single-well pools and whether this is based on offset well control and/or engineering data. If the size of a pool is unknown due to poor well control, the EUB may consider that it is premature to approve commingling, unless there are compelling reasons to do so. If pools are larger, not in a stage of advanced depletion, and/or have good deliverability, the EUB may consider that segregated production should be maintained to allow for the collection of segregated pool data for the purpose of enhancing pool management to obtain optimum recovery of reserves. Segregated data in these cases also allows the EUB to better fulfill its mandate to evaluate reserves.
b) where pool delineation or fluid interfaces are based on structural interpretation, a structure contour map of the pool and offsetting area,	You should only include a structural map if it is a key in determining fluid interfaces or pool delineation.

Requirements	Comments
c) an interpreted and annotated log cross-section or representative well log(s) showing i) stratigraphic interpretation of the zone(s) of interest, ii) interpretation of the fluid interfaces present, iii) completions and treatments to the wellbore(s), with dates, iv) cumulative production, v) finished drilling date and kelly bushing (KB) elevation, and vi) the scale of the log readings, and	For cases involving gas pools, an annotated representative well log is sufficient for the application. If oil pools are involved and the potential for enhanced oil recovery must be addressed, you should include the annotated cross-section.
d) a tabulation of the interpreted net pay, porosity, and water saturation for each well in the pool, along with the cutoffs, methodology, formulas, and constants used.	If you do not supply tabulated well data for all wells in the pools, you must explain why.
2) A discussion of the geology of the pools involved in the application.	A knowledge of the geological setting for a pool can add insight as to the quality of the pool (for example, a reservoir matrix that would result in poor permeability and/or poor productivity) and the likelihood that the pool may be extensive (e.g., the depositional environment, the trapping mechanism).
3) A tabulation of	
a) the results of deliverability, flow, or production tests on each pool proposed for commingling in the wells of interest, together with an indication of the type of test involved (e.g., AOFP) and the date of the test, and	The EUB is not prepared to consider requests to approve commingling of production from pools unless those pools are considered to be capable of production. This would at minimum entail flow test data showing that the individual pool is capable of production. (Copies of the actual tests are not required for the application unless specifically requested.)
b) where a well is currently producing, a tabulation summarizing the current productivity of each pool in the subject	Where a well is producing, only a summary of current productivity for each pool in the well involved is required—you should not

Requirements	Comments
well.	include the entire production history of the well in the application, unless the production trend is the basis for the request. Where the productivity of a pool has declined significantly or is low from the outset, the case for commingled production is strengthened in that it can be argued that commingling would allow each pool involved to produce economically for a longer time and thus enhance overall recovery.
4) A tabulation of the current bottomhole pressures at each well of interest for each of the pools subject to the application, together with an indication of the type and date of test. If there is a difference in pressures between the pools, a discussion respecting possible cross flow of reservoir fluids under commingled-completion operations (particularly when the well is shut in for any reason), which may have a negative effect on the recovery of reserves from any of the pools.	Pressure differences between pools raise the possibility that commingling of production may result in cross flow of reservoir fluids in the wellbore, which could adversely affect recovery from one or both of the pools involved. For example, recovery may be adversely affected by cross flow of fluids by gas entrapment behind the perforations, by precipitate formation resulting from incompatible reservoir fluids, or by the movement of fine particles. (Copies of the actual pressure tests are not required unless specifically requested.)
5) Where any oil pool is involved, an evaluation of the oil and gas reserves for each pool, including a) an estimate of the initial oil volume and gas volume in place, b) an estimate of the oil and gas recovery factors, c) a description of the methods used in determining (a) and (b) above (e.g., material balance, volumetric analysis, model study, a comparison of analog pools), and d) the supporting data used in determining (a) and (b) above and the sources of the data (e.g., pressure/volume/temperature (PVT) properties and source, pressure data and source).	Where any oil pool is involved, an evaluation of the reserves is required in order to support the discussion of enhanced recovery potential (see item 6).

Requirements	Comments
6) Where any oil pool is involved, a discussion respecting whether the oil pool involved has potential for an enhanced oil recovery scheme, and if so, the possible effect of approval for commingling of production on the effectiveness of such a scheme.	Commingling of production in the wellbore may not be an optimum strategy when it may hamper the effectiveness of an enhanced recovery scheme.
7) Where any gas pool located in an oil sands area is involved,	
a) a statement that the well involved would be producing in accordance with EUB *Interim Directive (ID) 99-1*, and	For all wells drilled and/or completed in a defined oil sands strata after July 1, 1998, an operator must submit an application and obtain approval from the EUB before any gas, other than solution gas, can be produced.
b) a discussion indicating that the loss of individual pool data resulting from the commingling will not adversely affect future evaluation of the impact of gas production on the bitumen resource in the area.	In an area where pool performance and pressure data are scarce (e.g., low drilling density, limited production), the ongoing collection of zonal data may prove crucial to future decisions on gas production and to the re-evaluation of past gas production approvals. Unless the EUB is satisfied that the region of influence of the gas zones in the area is well defined, commingling may be denied.

3.2 Background to Good Production Practice, Gas-Oil Ratio Penalty Relief, and Special Maximum Rate Limitation

Most new oil pools in Alberta initially have rate controls applied. These restrictions are designed to ensure that oil pools in the province are not significantly depleted before the pool's optimum depletion strategy can be determined. This helps to ensure that enhanced oil recovery (EOR) feasibility is addressed early in the pool's life, along with solution-gas conservation, concurrent production, and any equity problems among operators in the pool. The tool used by the EUB to impose rate controls is the Maximum Rate Limitation (MRL) Order.

Generally, the EUB will not approve accelerated production rates to improve the economics for initiating enhanced recovery or data gathering to determine and assist in optimization studies. The EUB also notes that the applicant should refer to *Guide 7.1: Allowables Handbook* for details on the administration of allowables and *Interim Directive (ID) 99-2: Revised Policy on Administration of Oil MRL's and Overproduction* regarding retirement of overproduction rules.

Applications to remove oil rate controls fall into three categories:

- a request that the oil pool be removed from the MRL system (GPP)
- a request that an amendment to the MRL Order modify or remove gas-oil ratio (GOR) penalties
- a request that an amendment to the MRL Order increase the MRL above its reserves-based value (Special MRL)

Before approving any of the above applications, the EUB must be satisfied that

- the pool is operating under its optimum depletion strategy to ensure that economic oil recovery is maximized,
- gas conservation has been addressed using the decision tree and economic decision process set out in EUB *Guide 60*, and
- equity issues have been resolved.

Because the issues are the same in each application, the EUB often approves GPP when GOR penalty relief and/or Special MRL have been applied for. The following section outlines the content requirements for these three applications, starting with GPP. GOR penalty relief and Special MRL are treated as alternatives to GPP when unique circumstances exist that would preclude granting GPP.

3.3 Application for Good Production Practice (GPP)—Primary Depletion Pools

This section deals only with GPP applications for pools under primary depletion. GPP removes a pool from restrictions imposed by the EUB's monthly MRL Order and is granted under Section 10.060 of the Oil and Gas Conservation Regulations. Under GPP, the wells in a pool are not restricted by base allowable or GOR penalties. However, as the name implies, operators are expected to produce the wells in accordance with good engineering practices to optimize oil recovery. The EUB may rescind GPP approval if new information or technology indicates that production under GPP may affect conservation or the rights of other owners in the pool. GPP may be granted with concurrent production restrictions on gas cap production or other conditions.

Note that for pools under primary depletion, GPP is granted to the pool, not to individual wells. For pools where EOR schemes exist, GPP is usually granted only to the ER oil scheme areas.

3.3.1 Requirements for an Application for GPP (file 3 copies)

Requirements	Comments
1) Your geological interpretation of the pool, including	
a) a net pay isopach map of the pool, including both oil and gas if there is an associated pool,	For primary pools, GPP is granted to the entire oil pool. Therefore, the application must provide a geological interpretation of the entire pool, not just lands you own.
b) where pool delineation or fluid interface locations are based on structural interpretation, a structure contour map of the pool and offsetting area,	If it will help to clarify your basis for pool delineation or other aspects of your geological interpretation, you should submit a log cross-section containing wells both within and outside of the pool. As a minimum, you must submit at least one representative well log from a well in the pool showing the information required in item 1(c).
c) an interpreted and annotated log cross-section or representative well log(s) showing the	
i) stratigraphic interpretation of the zone(s) of interest,	You must provide a clear picture of your geological interpretation, including the potential for further pool development.
ii) interpretation of the fluid interfaces present,	
iii) completions and treatments to the wellbore(s), with dates,	
iv) cumulative production,	
v) finished drilling date and kelly bushing (KB) elevation, and	
vi) scale of the log readings, and	
d) a tabulation of your interpreted net pay,	

Requirements	Comments
porosity, and water saturation for each well in the pool, along with the cutoffs, methodology, formulas, and constants used.	
2) Your evaluation of the oil and gas reserves for the pool, including a) an estimate of the initial oil volume and gas volume in place, b) an estimate of the oil and gas recovery factors, c) a description of the methods used in determining (a) and (b) above (e.g., material balance, volumetric analysis, model study, a comparison of analog pools), and d) the supporting data used in determining (a) and (b) above and the sources of the data (e.g., pressure/volume/temperature (PVT) properties and source, pressure data and source).	The size of oil and gas cap reserves affects depletion strategy, EOR feasibility, and gas conservation economics. The stage of depletion of the pool may influence the EUB's decision and should be discussed where appropriate. If there are sufficient pressure, production, and PVT data, you should do a material balance evaluation and compare it to the volumetric results. Failure to provide information on the calculation methods and supporting data will delay processing of your application. It is not necessary to provide production plots for the wells, except to illustrate a particular point or issue (e.g., decline analysis, specific well performance issues).
3) A discussion and analysis of why waterflooding or some other form of enhanced oil recovery (EOR) is not feasible for the pool. This should include a) your screening criteria and supporting calculations and data, b) if EOR was found to be technically feasible but uneconomic, your economic evaluation and supporting data, and c) if numerical simulation was used, a description of the model, the input data, results of history matching, cutoffs used for each case, descriptions of the cases run, and summaries and analyses of the results.	EOR evaluation is a critical part of any GPP application, and processing delays will result if it is not done properly. If the EUB agrees that the pool is a single-well oil pool with no potential for expansion or further drilling or is in good communication with a fully active aquifer system, EOR will not be an issue. If EOR is considered feasible, GPP will be denied pending implementation of EOR

Requirements	Comments
4) Analysis, discussion, and supporting data to show that producing the pool under GPP is the optimum depletion strategy for the pool. If there is gas-cap gas production, you need to supplement this with the information required for a CCP application and identify further conditions needed to approve CCP (e.g., gas rate limit, maximum GOR).	This should build on the analyses in items 3 and 4 above. Having eliminated EOR, you must satisfy the EUB that producing wells at unrestricted rates will not reduce primary recovery. If the MRL and GOR penalties do not restrict production in the pool now or in the future, you should include this in your discussion. At this point you may wish to request a reduced pressure test frequency in the pool if you can show that a lesser frequency is appropriate. Failure to adequately address CCP will delay processing. Please refer to the CCP application requirement in Unit 2, Section 2.4.
5) A discussion of the status of gas conservation from wells in the pool, including wells owned or operated by others. This discussion should a) confirm that full gas conservation from all wells is occurring and will continue, or b) outline the schedule for implementation of full gas conservation, or c) justify why you are not proposing full gas conservation under GPP.	Your evaluation of gas conservation should use the decision tree and economic decision process set out in EUB *Guide 60*, Sections 2.3 and 2.4. Under full gas conservation, only nonroutine flaring can occur. *Guide 60*, Section 2.6, defines nonroutine flaring at conserving facilities and specifies operational requirements to minimize this flaring. Failure to address gas conservation as per Guide 60 will result in processing delays and deficiency requests.
6) Individual legible maps showing a) the lessees in and adjoining the applied-for pool, and b) the lessors in and adjoining the applied-for pool.	To ensure clarity, you should construct your own map, rather than submit a photocopy from part of a commercial land map you purchased. Confusion about ownership in the area will delay processing.
7) If there is mixed ownership in the pool a) state that you are applying on behalf of all well licensees in the pool, or	You are encouraged to apply on behalf of all well licensees in the pool. If not, the EUB's application process must ensure that parties having a bona fide interest in the application are provided an opportunity to intervene. For

Requirements	Comments
	more information, refer to the Energy Resources Conservation Act and the corresponding EUB's Rules of Practice.
b) identify the well licensees not represented, explain why they are not represented, and evaluate the impact that GPP approval will have on the rights of these owners.	Your evaluation of the impact on parties not represented should include supporting data; otherwise processing will be delayed.

3.4 Application for Gas-Oil Ratio (GOR) Penalty Relief

Gas oil ratio (GOR) penalties are applied to an oil well's MRL when the producing GOR exceeds the base GOR. The penalty factor is calculated by taking the ratio of the base GOR to the producing GOR. The MRL is then multiplied by this penalty factor to determine the adjusted MRL (the permitted production rate). GOR penalty relief is applied for under Section 10.060 of the Oil and Gas Conservation Regulations.

GOR penalty relief applications face the same issues as GPP. For this reason, when processing a GOR penalty relief application, the EUB will often grant GPP, with full gas conservation as a condition. GOR penalty relief is approved through the application of a net GOR penalty factor, which reduces the GOR penalty by subtracting out any fuel gas or gas delivered to an approved gas gathering system.

GOR penalty relief is not automatic when gas is conserved. When GORs rise significantly above the solution GOR of the oil, this indicates that pressure depletion and/or gas cap coning is occurring, neither of which is desirable for optimum oil recovery. These issues must be addressed before an application can be approved, despite ongoing gas conservation.

3.4.1 Using the O-33 Form

To apply for GOR penalty relief, operators often use the O-33 form, which was introduced in 1989 as part of *Informational Letter (IL) 89-14*. The O-33 form is specifically targeted at small (one or two wells), low-quality pools (rates below minimum allowable initial high-water cuts). This *Directive 065* supersedes the requirements set out in *IL 89-14*, but the EUB will continue to accept the O-33 form for small, low-quality oil pools where the conservation and equity issues are not complex. See Appendix C for a copy of the O-33 form. If using this form, submit three copies to the EUB.

3.4.2 Requirements for an Application for GOR Penalty Relief

For GOR penalty relief application requirements, please use the GPP application requirements and comments (Section 3.3.1). Note that CCP must also be applied for (see Section 2.4) if the high GORs are a result of production from a gas cap. You should also state in your application why you are applying for GOR penalty relief rather than GPP.

3.5 Application for Special Maximum Rate Limitation (MRL)

A Special MRL is an MRL approved by the EUB that is greater than the reserves-based MRL. Special MRLs can be applied to entire pools or individual wells. Relatively few Special MRL applications are received or approved each year because, like GOR penalty relief, Special MRL applications have the same issues involved as GPP. For this reason, when processing a Special MRL application, the EUB will often grant GPP. A Special MRL is applied for under Section 10.060 of the Oil and Gas Conservation Regulations.

3.5.1 Requirements for an Application for a Special MRL

For Special MRL application requirements please use the GPP application requirements and comments (Section 3.3.1). You should also state in your application why you are applying for Special MRL rather than GPP.

3.6 Application to Amend or Rescind a Gas Allowable Order

3.6.1 Background

There are essentially three situations where the EUB may issue a gas allowable (GA) order for the purpose of setting the maximum allowed gas production rate for a gas well or wells in a pool:

- where the ultimate recovery of gas may be adversely affected by unrestricted production rates (Section 10.300(1) of the Oil and Gas Conservation Regulations [the Regulations]),
- where a gas well is completed outside of its prescribed target area and it is necessary to apply an off-target penalty to the well's base allowable for equity reasons (Section 4.070(1) of the Regulations, EUB *Interim Directives (ID) 94-2* and *94-5*), and
- where the Board has approved a fractional section as a drilling spacing unit and there is a need to apply an area-ratio production penalty or off-target penalty for equity reasons (Section 4.050(1) and (2) of the Regulations).

Section 10.095 of the Regulations designates that the base allowable for a gas well shall be its maximum daily allowable (Q_{max}). The calculation of Q_{max} is explained in Section 10.300(1)(c) of the Regulations and in EUB *Informational Letter (IL) 85-10*. In all instances above, the penalties are applied against the well's Q_{max} and an annual allowable (based on this Q_{max} and the number of days in the year) is assigned.

3.6.2 When to Make This Application

When a well is subject to an EUB gas allowable (GA) order and the well's licensee believes that circumstances warrant the allowable being rescinded or amended, an application can be made to change the allowable in accordance with Section 10.300(4) of the Regulations. There are a number of reasons for a change to a gas well's allowable, including

- equity (e.g., there is no longer an offsetting productive well),
- conservation (e.g., there is no longer a reason to restrict the rate for conservation reasons),
- pool delineation (e.g., data support a new pool interpretation that does not warrant the application of a gas allowable to the well), or
- administrative (e.g., the well can no longer meet the allowable).

The original reason for the initial assignment of the allowable will dictate the basis for any requested change, and the application must address what has changed since the original allowable was assigned to the well to justify the application. The majority of gas allowables are assigned for equity purposes, resulting in equity matters being of primary consideration in most applications to amend or rescind a GA order.

3.6.3 How the EUB Processes the Application

Upon receipt, the EUB reviews the application for completeness according to the following requirements. Particular attention is paid to equity considerations. If pool delineation is an issue (i.e., the EUB's current pool delineation is different from the applicant's and this difference is material to the assignment of the allowable), the EUB will undertake geologic and engineering reviews of the pool delineation. In all cases, contact with offset licensees will be checked to ensure that proper notification is conducted. In particular, contact with any offset licensee that caused the assignment of the original allowable will be ensured. Once the technical, administrative, and equity aspects of the application have been reviewed, a decision will be issued or a hearing will be set to consider the matter. Generally, a hearing is called only if there are bona fide objections to a change in the allowable from an offset licensee or if the EUB does not agree that a change is warranted and the applicant wishes the matter be considered at a hearing.

3.6.4 Requirements for an Application to Amend or Rescind a Gas Allowable Order (file 3 copies)

An application under Section 10.300(4) of the Regulations to either amend or rescind the maximum daily allowable prescribed to a gas well must include the following. The information required can vary, as noted in the Comments column below, depending on the reason for the original allowable being assigned.

Administration

Requirements	Comments
1) A statement that the application is made in accordance with Section 10.300(4) of the Oil and Gas Conservation Regulations.	This is a legal requirement.
2) The unique well identifier of the well for which you are requesting a change in the allowable.	
3) A summary of the basis of the application.	Why do you believe that the maximum daily allowable should be changed? You may need to address conservation and/or equity, depending on the reason for the original assessment of the allowable to the well.

Conservation

Requirements	Comments
1) A map showing the net pay isopachs and zero edge of the pool.	The EUB requires this information to confirm the pool extent. The pool's net pay and zero edge must reflect your actual geological interpretation of the pool.
2) A map showing the status of each well completed in the pool.	
3) A map showing the structure of the top and base of porosity and the initial and present fluid interfaces.	This information is required only when the allowable was originally assigned for conservation reasons, and then only when structure is pertinent to the application.
4) A map showing isobars of the pool.	This is generally only required if pool delineation is an issue.
5) Tabulations of a) reservoir parameters, b) the estimated initial in-place volumes of gas and other hydrocarbons in the pool, c) for the pool, the current rate of production of gas, other hydrocarbons, and water and an estimate of the probable pool production rates under the proposed operating conditions, and d) for each well, the current productive capacity, the current average production rate, and the production rate anticipated under the proposed operating conditions.	The information referred to in 5(c) and (d) is generally required for the entire pool only when allowables have been set for an entire pool for conservation reasons or when pool delineation is an issue. When only a portion of the pool is affected by the subject allowable, data on just the subject well and immediately offsetting wells are usually sufficient.
6) Discussions of a) pertinent characteristics or conditions that exist within the pool, including geological factors, reservoir characteristic, general or local fluid interface movements, pressure gradients, areal drainage, or production conditions,	Information referred to in 6(a) and (b) is required only when the allowable was originally assigned for conservation reasons.

Requirements	Comments
b) the predicted future recovery of gas and other hydrocarbons from the pool under existing production rate limitations and under the proposed operating conditions, particularly the uniformity of drainage within the pool, and	
c) the conservation and administrative benefits that would accrue from granting the application.	
7) An interpreted and annotated log cross-section or representative well log(s) showing	This information is required only when the allowable was originally assigned for conservation reasons or when pool delineation is an issue. You may present this cross-section in a number of ways (as one representative well log, several well logs, or a detailed cross-section of the entire pool) depending on the complexity and heterogeneity of the pool.
a) stratigraphic interpretation of the zone(s) of interest,	
b) interpretation of the fluid interfaces present (current and original, if applicable),	
c) completions and treatments to the wellbore(s), with dates,	
d) cumulative production,	
e) finished drilling date and kelly bushing (KB) elevation,	
f) the scale of the log readings, and	
g) a tabulation of your interpreted net pay, porosity, and water saturation for each well in the pool, along with the cutoffs, methodology, formulas, and constants used.	If you do not supply tabulated well data for all wells in the pool, you must explain why the data are not included (e.g., the allowable affects only a portion of the entire pool). As a minimum, you must provide the data for the subject well and all immediately offsetting wells.
8) A discussion of	
a) well completion and recompletion details and assessment of the prospects for control of water production in the future,	The information for 8(a) to (e) is required only when the allowable originally was assigned for conservation reasons.
b) operating problems,	

Requirements	Comments
c) the effect of increased production on liquid coning, terminal fluid interface position, and interpool interference,	
d) the effect on the rates of production of any oil, condensate, or pentanes plus that may be present in the pool if the application is granted,	
e) appropriate economic analyses, and	
f) pertinent reservoir studies.	The information for 8(f) is required only when the allowable was originally assigned for conservation reasons or when pool delineation is an issue.

Notification—Equity

The EUB requires the information described below to establish who potentially adversely affected parties are and whether equity issues may exist. You are encouraged to carry out the notification described here. The EUB reserves the right to advertise any application for its own purposes.

Requirements	Comments
1) A map showing	This information generally is required only when the allowable originally was assigned for conservation reasons or when pool delineation is an issue.
a) the zero edge of the pool,	
b) the status of each well completed in the pool, and	
c) the licensees in the pool and for 1600 m surrounding the pool that contains the well for which a change to allowable is requested.	Generally, only when allowables have been set for an entire pool for conservation reasons is the full level of notification referred to in 1(c) required. The 1600 m buffer around the pool is included to ensure that no offset licensees have a different interpretation of the pool. In most cases, affected parties are those considered by the EUB to have a productive well in the same geological pool in a drilling spacing unit (DSU) immediately offsetting the subject well. If the allowable was established because the subject well is off target, generally only wells in the same geological pool that the subject well is off target towards are

Requirements	Comments
	considered to be affected, as per EUB *Interim Directive (ID) 94-2.* If the allowable was originally assigned for equity reasons, the offset licensees who requested that the allowable be set must be contacted.
2) A list of the parties notified regarding the proposed allowable change, the nature of the notification, the date of notification, and any comments received from the notified parties.	
3) A discussion of the effect that granting the application would have on the interests of other owners in the same pool.	

Unit 4 Disposal/Storage

4.1 Application for Class I-IV Disposal

4.1.1 Background

Disposal refers to the injection of fluids for purposes other than enhanced recovery or gas storage. In accordance with the Oil and Gas Conservation Act, Section 39(1)(c), EUB approval of a scheme is required for the gathering, storage, and disposal of water produced in conjunction with oil and gas. Section 39(1)(d) requires EUB approval of a scheme for the storage or disposal of any fluid or other substance to an underground formation through a well.

The EUB classifies disposal wells based on the type of injection fluid. This classification system is outlined in EUB *Guide 51*, Section 2.4.

4.1.2 When to Make This Application

If disposal of a fluid is required and you are certain that disposal at the proposed location will not cause an environmental or safety hazard and will not result in incremental hydrocarbon recovery, then you should make an application for disposal to the EUB. As identified in EUB *General Bulletin (GB) 2000-8,* the EUB will approve a disposal well prior to completion of *Guide 51* requirements. However, injection may not commence until the requirements of *Guide 51* have been met, submitted, and approved by the EUB.

4.1.3 How the EUB Processes the Application

An application for disposal would likely be approved if the EUB is satisfied that

- disposal will not impact hydrocarbon recovery,
- the disposal fluid will be confined to the injection formation,
- offset owners within 1.6 km of the disposal well(s) have been consulted and have no objections or concerns to the disposal scheme, and
- the applicant has the right to dispose into the requested formation.

4.1.4 Requirements for an Application for a Disposal Scheme (file 3 copies)

General

Requirements	Comments
1) A description of the proposed disposal scheme, including	
a) unique well identifier(s),	
b) disposal zone with zone top and base,	
c) disposal perforations,	

Requirements	Comments
d) disposal fluid class,	You should identify the class of the disposal fluid according to the system outlined in *Guide 51*.
e) anticipated daily disposal volume(s),	
f) injection pressure,	It is not desirable for disposal wells to exceed the fracture pressure because of possible isolation problems. If you are not providing formation fracture data or other information, such as a step-rate injectivity test, to support the requested maximum wellhead injection pressure, you should use *Guide 51*, Appendix 5: Maximum Allowable Wellhead Injection Pressures.
g) depth of the production packer, and	The packer should be set within 15 m of the perforation interval.
h) the base of the usable groundwater.	For groundwater information, see the Alberta Environment Groundwater Database available from EUB Information Services. Produced water disposal cannot occur into the zone of origin or other formations identified as containing usable groundwater because there is no way to monitor or ensure that the produced water is not contaminated by the production process. For more information on this, see *General Bulletin (GB) 2000-8*.
2) A statement on why the proposed well is suitable for disposal.	
3) A statement on why the proposed disposal is required.	
4) An indication of whether you have applied for or obtained approval for related surface facilities.	Surface facility applications must be made in accordance with *Guide 56* or *Guide 58*.
5) Identification of the following:	
a) fluid type currently in the disposal interval (i.e., water, gas, or oil),	
b) confinement strata, if present,	
c) porosity and permeability of the	

Requirements	Comments
disposal zone, d) viscosity of the injected fluid and the reservoir fluid, and e) the distance between the proposed disposal well(s) and any hydrocarbon pool or accumulation.	
6) An interpreted and annotated log cross-section or representative well log(s) showing a) stratigraphic interpretation of the zone(s) of interest, b) interpretation of the fluid interfaces present, c) completions and treatments to the wellbore(s), with dates, d) cumulative production, e) finished drilling date and kelly bushing (KB) elevation, and f) the scale of the log readings.	

Conservation

If disposal is to occur into a hydrocarbon pool or an associated aquifer, it must be evident that it will not have a detrimental effect on ultimate hydrocarbon recovery from the pool.

If the proposed disposal well is more than 1.6 km from any hydrocarbon pool or accumulation, you may omit requirements relating to conservation.

Requirements	Comments
1) Identification of the EUB-designated pool to receive the disposal fluid and/or any EUB-designated pool within 1.6 km of the proposed disposal well.	
2) A statement on whether incremental hydrocarbon recovery is anticipated as a result of the proposed injection. If it is, state the incremental volume relative to the original oil in place (OOIP).	If incremental recovery is anticipated as a result of the proposed injection, consider applying for enhanced recovery rather than disposal.

Requirements	Comments
3) Discussion on the stage of depletion of the recipient pool.	
4) A statement on whether the pool contains an oil-water (o/w) or gas-water (g/w) contact. If it does, are the injection perforations below that contact?	If disposal occurs into a depleted pool or below the oil-water or gas-water contact, the negative impact of this disposal on ultimate recovery from the pool would usually be minimal.
5) An explanation of why the proposed disposal would not be detrimental to ultimate hydrocarbon recovery from the pool.	
6) Discussion on whether the proposed injection would have an impact on any producing wells in the pool. If it would, provide details. If it would not, support your view.	
7) If EUB-approved water disposal is currently occurring in the pool, a list of those disposal wells and comments as to how the proposed disposal is compatible with the current disposal locations.	Multiple disposal wells in a pool require careful placement in order to avoid overinjection in any one part of the pool and to avoid trapping losses.
8) Discussion on whether there is an enhanced recovery scheme in the subject pool. If there is, explain why the proposed disposal cannot be incorporated into the scheme and why or how the proposed disposal is compatible with the current injection.	
9) A net pay isopach map of the pool, including both oil and gas if there is an associated pool.	
10) Where pool delineation or fluid interface locations are based on structural interpretation, a structure contour map of the pool and offsetting area.	

Requirements	Comments
11) A tabulation of your interpreted net pay, porosity, and water saturations for each well in the pool, along with the cutoffs, methodology, formulas, and constants used.	If you do not supply tabulated well data for all wells in the pool, you must explain why (e.g., the area of application is very small relative to the entire pool).

Hydraulic Isolation

Disposal approvals specify the disposal zone and limit injection to that zone only. Migration of disposal fluids to other zones is highly undesirable. Therefore, a suite of logs is required for all injection wells in the province in order to confirm the absence of flow of injected fluid behind the casing. For more details on the logging requirements, see EUB *Guide 51*. The EUB will monitor to ensure that *Guide 51* requirements have been met prior to the commencement of injection.

Requirements	Comments
1) For disposal wells injecting hydrogen sulphide (H_2S) and Class I disposal, all completion logging, testing requirements, and associated discussion required by *Guide 51*.	All H_2S and Class I disposal wells must meet the *Guide 51* requirements prior to the wells going on injection and prior to the approval being issued. It is necessary to ensure that the integrity of the wellbore will prevent contamination of other zones and protect all groundwaters. A preliminary review of the application and a letter noting approval in principle pending successful *Guide 51* completion and proven injectivity may be issued if you desire to proceed with the application in two stages.
2) In order to prove hydraulic isolation for Class II-IV provide the following: a) the completion logs and associated discussion required by *Guide 51* for all proposed disposal wells, **or** b) a discussion of the plans for complying with *Guide 51*, **or** c) a request for waiver of the *Guide 51* requirements, **or**	You should specify in the application whether the proposed disposal wells are in compliance with *Guide 51* requirements. If they are not, provide a discussion of the plans to bring the wells into compliance with *Guide 51* or indicate that a waiver is requested or has been approved. It is not necessary for *Guide 51* requirements to be met in order for a disposal scheme approval to be issued except when H_2S or Class I disposal is requested. All disposal well completions must meet the *Guide 51* requirements prior to the wells

Requirements	Comments
d) a copy of an EUB letter waiving the *Guide 51* requirements.	going on injection in order to ensure that hydraulic isolation of the disposal interval exists at the wellbore and that the disposal fluid will enter the intended reservoir interval. The EUB will permit injection of up to 500 m^3 of water to obtain the required isolation logs. If you have met *Guide 51* requirements for the proposed disposal wells, you must include the completion logs and associated discussions required by the guide. The EUB will then handle all matters pertaining to the completion approval(s) concurrently with the scheme approval. **If you have not met *Guide 51* requirements, disposal may NOT commence until you have received a letter from the EUB stating that the *Guide 51* requirements have been met and injection can commence.**
3) If you are requesting an extension to the three-month *Guide 51* submission date, provide a) the proposed submission date, and b) the reasons(s) for needing the submission date extension.	Disposal well approvals issued in advance of *Guide 51* requirements being met will contain a clause requiring that the *Guide 51* information be submitted within three months of the approval's issue date. If three months is not sufficient time to meet the *Guide 51* requirements, you must request an extension.
4) When submitting *Guide 51* information after the approval has been issued, you should provide the field and pool name, the disposal scheme approval number, and the well location(s).	If the *Guide 51* requirements are not submitted within the three months or other approved time frame, EUB staff will rescind the approval or portion pertaining to the subject wells. For more information on submission requirements and the disposal approval process, see EUB *General Bulletin (GB) 2000-8*.

Equity—Class II-IV Only

Disposal could occur into or near a multiownership pool, and owners' views on the impact of the disposal might vary. Note that, as identified in Tables 1 and 2 of the Resources Applications Notification Guidelines, notification requirements differ for waste and other disposal fluid types. For waste disposal applications, see the section on Oilfield or Industrial Waste Fluid Disposal below.

Requirements	Comments
1) A list of all potentially adversely affected parties (unit operators, approval holders, and/or well licensees) within a 1.6 km radius from the proposed disposal well(s) where the proposed disposal zone is known to be present.	Where a pool is subject to unit operations or other approvals, in most cases you may notify the unit operator or approval holder on behalf of the relevant group having an interest in the pool. Otherwise, you should normally notify individual well licensees.
2) A statement as to whether you have contacted the above parties respecting the application and, if so, confirmation of nonobjection or specific details regarding objections or concerns.	If discussions concerning the application are continuing with offset operators, you should provide details as part of the application.
3) Evidence of your right to dispose into the proposed zone.	Proof of the right to dispose in a formation is as follows: • unleased Crown land—a letter of consent from the Crown, • freehold lease land—consent from the freehold mineral holder, and • leased by other than the applicant—a letter of consent from the lease holder.

Oilfield or Industrial Waste Fluid (Class I) Disposal

The following are further requirements pertaining to Class I disposal only. Note that generally you must obtain a surface facility approval from the EUB Facilities Waste Management Section and/or Alberta Environment before the EUB may issue a waste disposal well approval. For more information on waste facility applications, see *Guide 58*. You may obtain information on industrial waste facilities applications from the appropriate Alberta Environmental Corporate Regional office.

Requirements	Comments
1) Evidence of notification to and consent from the surface owner and/or occupant within a radius of 0.5 km from the proposed disposal well.	In view of the possible hazardous nature of waste disposal fluids, extra precautions are taken to ensure containment.
2) Evidence of notification to and consent from potentially adversely affected parties (unit operators, approval holders, well licensees, mineral lessees, and/or mineral lessors) within a 1.6 km radius of the proposed disposal well.	Where a pool is subject to unit operations or other approvals, in most cases you may notify the unit operator or approval holder on behalf of the relevant group having an interest in the pool. Otherwise, you should normally notify individual well licensees.
3) Evidence of your right to dispose into the proposed zone.	Proof of the right to dispose in a formation is as follows: • unleased Crown land—a letter of consent from the Crown, • freehold lease land—consent from the freehold mineral holder, and • leased by other than the applicant—a letter of consent from the lease holder.
4) A discussion of the geological setting of the proposed disposal zone, including the integrity of the base and caprock and the stratification within the reservoir and reservoir parameters, giving vertical and horizontal permeabilities, thickness, and areal extent.	

Requirements	**Comments**
5) A discussion of the maximum expected area of influence surrounding the proposed well over the life of the scheme, including a discussion of any pressure gradients that exist as a result of past or current production or injection operations.	
6) Confirmation that all wells within the area of influence have been completed or abandoned in such a manner that they will not provide a path for the migration of the injected fluid or substance to another formation.	Oilfield or industrial waste fluids must **not** be disposed into a zone that has current production or the potential for future production.
7) In the case of slurry fracture injection of sand, details of the surface elevation monitoring that will be done within 800 m of the proposed disposal well to monitor the impact of slurry fracture injection of sand above the formation fracture pressure.	
8) Injection logs and analysis in accordance with *Guide 51*.	Confirmation of hydraulic isolation is required before the EUB will issue an approval for waste disposal. This requirement differs from Class II-IV disposal because of a greater concern about waste contamination. For more details see *General Bulletin (GB) 2000-8*.
9) Evidence of compliance with the completion and testing requirements outlined in *Guide 51*.	

4.2 Application for Acid Gas Disposal

4.2.1 Background

Acid gas disposal has become a cost-effective means to dispose of uneconomic quantities of hydrogen sulphide (H_2S) and carbon dioxide (acid gas) into underground formations. The formation types that the EUB typically considers suitable for disposal are depleted hydrocarbon-bearing zones or unusable-water-bearing zones. The disposal of these waste by-products can reduce public concern resulting from sour gas production and flaring. Section 39(1)(d) of the Oil and Gas Conservation Act requires that no scheme for the disposal of any fluid to an underground formation shall proceed unless approved by the EUB.

4.2.2 Requirements for an Application for an Acid Gas Disposal (file 3 copies)

Containment

Requirements	Comments
1) Your geological interpretation of the acid gas disposal formation involved, including a) net pay isopach map of the pool, b) where pool delineation or fluid interfaces are based on structural interpretation, a structural contour map of the pool and offsetting area, c) an interpreted and annotated log cross-section or representative well log(s), showing i) stratigraphic interpretation of the zone(s) of interest, ii) interpretation of the fluid interfaces present, iii) completions/treatments to the wellbore(s), with dates, iv) cumulative production, v) finished drilling date and kelly bushing (KB) elevation, and vi) the scale of the log readings, and	It is necessary to determine that there will be containment of the disposal fluid within a defined area and geologic horizon to ensure that there is no migration to hydrocarbon-bearing zones or groundwaters. To address this issue, you must provide a suite of geological evidence.

Requirements	Comments
d) tabulation of your interpreted net pay, porosity, and water saturation for each well in the pool, along with the cutoffs, methodology, formulas, and constants used.	
2) For bounding formations, information including a) continuity and thickness of base and caprock, b) lithology, c) integrity of the base and caprock, d) if fracturing is evident, explanation of how containment can be assured, and e) a comment on the stratigraphic, structural, or combination reservoir trap type and its containment features.	

Reservoir

Requirements	Comments
1) Analysis of the native reservoir fluid(s).	The impact of the disposal fluid on the reservoir rock matrix, native fluid, and the pressure variations subjected to the disposal zone requires that you address phase behaviour, pressure, and migration issues.
2) Acid gas properties, including a) composition, b) viscosity, density, gas injection formation volume factor, and compressibility factors, and c) phase behaviour through the range of pressures and temperatures to which the injected fluid will be subjected.	
3) An analysis of laboratory testing for	

Requirements	Comments
determining injected fluid interaction with matrix, caprock matrix, and native fluid(s).	
4) Migration calculation showing radius of influence, as well as a discussion if migration could occur due to displacement, gravity, fingering, etc. (not required for depleted reservoirs less than two sections in areal extent).	
5) Complete pressure history of the pool, with material balance calculations if proposed disposal zone is a depleted hydrocarbon pool.	
6) Bottomhole injection pressure, maximum sandface pressure, caprock threshold pressure, fracture propagation pressure, and formation fracture pressure.	It is not desirable for disposal wells to exceed the fracture pressure because of possible isolation problems. If you are not providing formation fracture data or other information, such as a step-rate of injectivity test, to support the requested maximum wellhead injection pressure, use *Guide 51*, Appendix 5.
7) Injectivity of the reservoir, proposed daily maximum injection rate, cumulative disposal volume, and expected life of the scheme.	

Hydraulic Isolation

Requirements	Comments
1) For acid gas disposal wells injecting H_2S, all completion data, well logs, testing requirements, and associated discussion, as described in *Guide 51*.	All H_2S disposal wells must meet the *Guide 51* requirements prior to the wells going on injection and prior to the approval being issued. It is necessary to ensure that the integrity of the wellbore will prevent contamination of other zones and protect all groundwaters. The EUB may issue a preliminary review of the application and a letter noting approval in principle pending successful *Guide 51* completion and proven injectivity if you desire to do the application in two stages.
2) For non-H_2S gas disposal provide	You should specify in the application

Requirements	Comments
a) the completion logs and associated discussion required by *Guide 51* for all proposed disposal wells, or b) a discussion of the plans for complying with *Guide 51*, or c) a request for waiver of the *Guide 51* requirements, or d) a copy of an EUB letter waiving the *Guide 51* requirements.	whether the proposed disposal wells are in compliance with *Guide 51* requirements. If they are not, provide a discussion of the plans to bring the wells into compliance with *Guide 51* or indicate that a waiver is requested or has been approved. It is not necessary for *Guide 51* requirements to be met in order for a disposal scheme approval to be issued except when H_2S is to be injected. All disposal well completions must meet the *Guide 51* requirements prior to the wells going on injection in order to ensure that hydraulic isolation of the disposal interval exists at the wellbore and that the disposal fluid will enter the intended reservoir interval. The EUB will permit injection of up to 500 m^3 of water to obtain the required isolation logs. If the proposed disposal wells meet *Guide 51* requirements, you must include the completion logs and associated discussions required by the guide. The EUB will then handle all matters pertaining to the completion approval(s) concurrently with the scheme approval. The EUB will review the scheme shortly after the approval is issued and undertake enforcement action if disposal has not commenced as specified in the approval. **If you have not met *Guide 51* requirements, disposal may NOT commence until you have received a letter from the EUB stating that the *Guide 51* requirements have been met and injection can commence.**
3) If requesting an extension to the three-month period for *Guide 51* submission date, provide a) the proposed submission date, and b) the reason(s) for needing the submission date extension.	Disposal well approvals for non-H_2S gas injection issued in advance of *Guide 51* requirements being met will contain a clause requiring that the *Guide 51* information be submitted within three months of the approval's issue date. If three months is not sufficient time to meet the *Guide 51* requirements, you must request an extension

Requirements	Comments
	If the *Guide 51* requirements are not submitted within the three months or other approved time frame, EUB staff will rescind the approval or portion pertaining to the subject wells. For more information on submission requirements and the disposal approval process, see *General Bulletin (GB) 2000-8*.
4) When submitting *Guide 51* information after the approval has been issued, provide the field and pool name, the disposal scheme approval number, and the well location(s).	
5) Provide the following information for either 1) all the wells in the pool if disposal is into a depleted hydrocarbon pool or 2) all the wells within the disposal well section and adjoining sections if disposal is into an aquifer system: a) well location, b) status of well, c) completion intervals, and d) all casing information.	There must be hydraulic isolation between the disposal fluid and any other wellbores drilled into or through the disposal zone.

Notification—Equity and Safety

Requirements	Comments
1) Evidence of your right to dispose into the proposed zone.	Proof of the right to dispose in a formation is as follows: • unleased Crown land—a letter of consent from the Crown, • freehold lease land—consent from the freehold mineral holder, and • leased by other than the applicant—a letter of consent from the lease holder.

Requirements	Comments
2) Provide a) a map showing the boundaries of the disposal pool or the area within the disposal section and the adjoining offset sections up to a 1.6 km radius with well licensees, mineral right lessees, and lessors recorded, and b) a statement confirming that all potentially adversely affected parties that may be impacted have been notified and giving any details of outstanding objections or concerns to the proposed scheme.	Disposal could occur into or near a multiownership pool, and owners' views on the impact of the disposal might vary. You must notify all lessors, lessees, and well licensees within the depleted hydrocarbon pool OR within the disposal section and the adjoining offset sections up to a 1.6 km radius if disposal is into an aquifer system. Where a pool is subject to unit operations or other approvals, in most cases you must notify the unit operator or approval holder on behalf of the relevant group having an interest in the pool. Otherwise, you should notify individual well licensees. If discussions concerning the application are continuing with offset operators, you should provide details as part of the application.
3) If the injected fluid contains any hydrogen sulphide, a statement indicating that notification of the scheme for emergency response plan (ERP) purposes has been made to all potentially adversely affected parties. Include the details of any outstanding objections or concerns from the notified parties.	Where facilities may pose a risk to the public, ERP requirements must be met prior to commencement of operations. Generally, an ERP is required if a risk assessment indicates that there are members of the public within a defined hazard area. ERPs are approved and reviewed for compliance by the Operations Group of the EUB Surveillance Branch. Contact Production Operations (403-297-2625) if further information is needed.

4.3 Application for Underground Gas Storage

4.3.1 Background

The storage of gas into underground hydrocarbon reservoirs can be for production-motivated reasons or commercial operations. Production-motivated schemes are usually characterized by the temporary storage of gas occurring at or near the producing pools. They can allow for the more efficient use of production and processing facilities and may also be of benefit in market-related situations. Commercial gas storage schemes are designed to provide an efficient means of balancing supply with a fluctuating market demand. These schemes store third-party nonnative gas, allowing marketers to take advantage of seasonal price differences, effect custody transfers, and maintain reliability of supply. Gas from many sources may be stored at commercial facilities under fee-for-service, buy-sell, or other contractual arrangements.

The EUB regulates gas storage operations to ensure that all gas conservation, equity, environment, and safety issues are addressed and to maintain up-to-date estimates of provincial gas reserves and deliverability.

4.3.2 Terms of Application

An application for approval of a new scheme or amendment to an existing scheme for the underground storage of gas is made under Section 39(1)(b) of the Oil and Gas Conservation Act. It must initially include the requirements detailed below and possibly other information if EUB staff find that necessary for evaluation purposes.

4.3.3 Application Requirements for Underground Gas Storage (file 3 copies)

Conservation

The EUB is concerned about any reserve losses that may occur through gas storage. Reservoir containment of the gas, gas trapping by water, excessive water production, and the dilution of produced gas by acid gas are the primary issues that need to be evaluated.

Requirements	Comments
1) Your geological interpretation of the pool, including	
a) a net pay isopach map of the pool, including both oil and gas if there is an associated pool,	If the pool has a good geological history that is well defined, only one representative well log is likely required. However, if the pool is complex and has had recent development, you should provide several well logs to a detailed cross-section of the pool. If the geological interpretation submitted is not adequately done, processing delays could result.
b) where pool delineation or fluid interface locations are based on structural interpretation, a structure contour map of the pool and offsetting area,	
c) an interpreted and annotated log cross-section or representative well log(s) showing	

Requirements	Comments
i) stratigraphic interpretation of the zone(s) of interest, ii) interpretation of the fluid interfaces present, iii) completions and treatments to the wellbore(s), with dates, iv) cumulative production, v) finished drilling date and kelly bushing (KB) elevation, and vi) the scale of the log readings, and d) a tabulation of your interpreted net pay, porosity, and water saturation for each well in the pool, along with the cutoffs, methodology, formulas, and constants used.	
2) Maximum bottomhole injection pressure and maximum average reservoir pressure.	This information defines the upper limit to the operating pressures of the scheme.
3) Complete tabulated pressure history of the pool (date, well, type of test, stabilized pressure), along with a P/Z versus cumulative gas production plot if the pool is a nonassociated gas pool, or material balance calculations if storage is into a gas cap in communication with an oil leg.	This history indicates pressure support from the aquifer and how the reservoir may react to storage.
4) Gas analysis of the native reservoir fluid and the proposed injected gas stream(s).	This describes what the compositions of the gases are before they become mixed.
5) Discussion of how the storage of gas will be consistent with sound conservation practices.	
6) If at any time during storage, the average reservoir pressure will exceed the initial pool pressure (i.e., delta pressuring is being applied for), then reservoir containment of gas becomes a concern and the following are required:	

Requirements	Comments
a) for the storage formation, a list of the formation fracture pressure and fracture propagation pressure, with a description of how they were determined, and	It is necessary to determine if the storage formation will be fractured and/or the extent to which the fractures may spread.
b) for the bounding formations,	
i) the continuity and thickness of base and caprock,	
ii) lithology,	
iii) evidence of fracturing,	
iv) a comment on the integrity of the base and caprock (stratigraphic, structural, or combination) and its containment features, and	
v) caprock threshold pressure.	
7) If there is an active aquifer system present, the trapping of gas displaced into the rising aquifer is a concern and the following are required:	
a) any measured changes in the gas/water contact, and	This will indicate where trapped gas can occur.
b) impact from the aquifer, including quantifying the amount of displaced gas that will be trapped.	This will state the impact by the aquifer and indicate whether it is a concern for storage.
8) If there are wells in the pool that have produced or are producing with high water/gas ratios (e.g., over 100 m^3/E^6m^3), loss of wells due to water coning or channelling is a concern and the following are required:	
a) production history for the wells with high water/gas ratios, and	This will show where the water problems may be occurring in the pool and how they were/are handled.
b) a discussion on how the water production is controlled.	

Pool Reserves and Deliverability Information

The EUB updates and publishes pool reserves data annually. For this reason it needs to understand the operations at the pool. Commercial gas storage pools are also listed in the annual reserves report, but rather than showing the remaining reserves for these pools, the storage capacity and maximum deliverability are published.

Requirements	Comments
1) An estimate of the initial gas and oil volumes in place.	This information will indicate the initial producible gas reserves.
2) An estimate of the gas and oil recovery factors.	
3) A description of the methods used in determining the initial gas/oil volumes in place and the respective recovery factors (e.g., material balance, volumetric analysis, model study, and a comparison of analog pools).	
4) The supporting data used in determining the first two points as outlined above and the sources of the data (e.g., pressure/volume/temperature (PVT) properties and source, pressure data and source).	
5) Remaining native gas in place and the cushion gas required for storage operations.	It is important to determine the remaining native gas in place before storage commences and what additional gas needs to be injected to meet the cushion gas requirements.
6) Working gas volumes.	This information will determine the storage capacity of the pool.
7) Deliverability and injectivity of the reservoir under the range of operating conditions.	This information will indicate the production and injection capabilities of the pool.

Equity

Equity is an important issue for gas storage pools, since competitive gas production would be detrimental to storage scheme operations. Therefore, it is advisable that you own all of the mineral right leases in the pool and adjoining sections or at least have a production-sharing agreement and written consent from the other owners that could be impacted.

It is also strongly advised that if some land is still available for sale, you purchase this land before considering the pool for storage.

The lessors must also provide consent for storage, since a special royalty agreement covering the remaining producible gas reserves may be required.

If all potential equity concerns are addressed before the scheme is approved, a costly and complicated hearing process may be avoided in the future.

You must notify all lessees and lessors within the area of the storage pool and adjoining offsetting sections. Notification must cover all zones, including those that either underlie or overlie the storage pool. You must also notify all well licensees in the pool.

Requirements	Comments
1) A map showing the boundaries of the storage pool (both EUB pool outline and your pool outline), along with the well licensees and mineral right lessees and lessors that are within these boundaries, as well as those that lie outside in the offsetting sections.	
2) A statement confirming that you have notified all parties that may be impacted, either negatively or positively, and that they have no objection or concerns to the proposed storage scheme (this includes, but is not limited to, the groups listed in item 1 above).	
3) A list of all objections or concerns received.	
4) If you do not hold all of the mineral right leases in the pool, an indication of the area in the pool where you do not own the mineral right leases and an explanation of why you have not purchased them.	It is important to understand the risk involved with a competing company buying mineral rights and drilling a productive well.

Environment and Safety

The EUB is also responsible for environment and safety issues when approving gas storage schemes. Therefore all injection wells must meet the requirements of EUB *Guide 51* to ensure that the integrity of the wellbore will prevent contamination of other zones and to protect all groundwaters.

Requirements	Comments
1) For gas storage wells injecting hydrogen sulphide (H_2S), all completion data, well logs, testing requirements, and associated discussions, as described in *Guide 51*.	All gas storage wells injecting gas containing H_2S must meet *Guide 51* requirements prior to the wells going on injection and prior to the approval being issued. It is necessary to ensure that the integrity of the wellbore will prevent contamination of other zones and protect all groundwaters. A preliminary review of the application and a letter noting approval in principle pending successful *Guide 51* completion and proven injectivity may be issued if you desire to do the application in two stages.
2) For non-H_2S gas storage provide a) the completion logs and associated discussion required by *Guide 51* for all gas storage wells, or b) a discussion of your plans for complying with *Guide 51*, or c) a request for waiver of the *Guide 51* requirements, or d) a copy of an EUB letter waiving the *Guide 51* requirements.	You should specify in the application whether the proposed gas storage wells are in compliance with *Guide 51* requirements. If they are not, provide a discussion of the plans to bring the wells into compliance with *Guide 51* or indicate that a waiver is requested or has been approved. It is not necessary for *Guide 51* requirements to be met in order for a gas storage scheme approval to be issued except when H_2S is to be injected.
3) When requesting an extension to the three-month period for *Guide 51* submission, provide a) the proposed submission date, and b) the reason(s) for needing the submission date extension.	For gas storage scheme approvals for non-H_2S gas injection issued in advance of *Guide 51* requirements being met, the EUB will expect you to submit the *Guide 51* information within three months of the approval's issue date. If three months is not sufficient time to meet the *Guide 51* requirements, you must request an extension.

Requirements	Comments
4) When submitting *Guide 51* information after the approval has been issued, provide the field and pool name, the disposal scheme approval number, and the well location(s).	If you do not submit the *Guide 51* requirements within the three months or other approved period, the EUB will rescind the gas storage approval or portion referencing the specific well(s). If *Guide 51* has been met for the proposed gas storage wells, you must include the completion logs and associated discussion required by the guide. The EUB will then handle all matters pertaining to the completion approval(s) concurrently with the scheme approval. **If you have not met *Guide 51* requirements for the proposed storage well(s), in no case shall injection to the gas storage well(s) commence until you have received a letter from the EUB indicating that *Guide 51* requirements have been met.**
5) If the injected fluid contains any H_2S, a statement is required indicating that notification of the scheme for emergency response plan (ERP) purposes has been made to all potentially adversely affected parties. You must include the details of any outstanding objections or concerns from the notified parties.	Where facilities may pose a risk to the public, ERP requirements must be met prior to commencement of operations. Generally, an ERP is required if a risk assessment indicates that there are members of the public within a defined hazard area. ERPs are approved and reviewed for compliance by the Operations Group of the EUB Surveillance Branch (call 403-297-2625 if you require further information).

Monitoring Scheme Operation

After a storage scheme has been approved and is placed into operation, the performance of the scheme becomes an issue. The EUB is interested in ensuring that the scheme will be operated within the conditions of the approval.

Requirements	Comments
1) A discussion of the monitoring program, including the frequency and method of measuring the bottomhole and/or top-hole pressures.	This discussion will determine how the scheme will be operated to ensure that the approval conditions will not be exceeded.

Unit 5 Corporate Changes

5.1 Change in Name of Approval Holder

5.1.1 Background

In accordance with Section 15.080 of the Oil and Gas Conservation Regulations, the operator of a scheme approved under Section 39 of the Oil and Gas Conservation Act should apply to amend the approval to show the name change that has occurred since the scheme was approved.

5.1.2 Requirements for an Application for a Change in Name of Approval Holder (file 3 copies)

Requirements	Comments
1) Approval number.	As an operator doing business in Alberta, it is your responsibility to keep the appropriate documents current.
2) Field and pool named on the approval.	
3) Type of scheme.	
4) a) Evidence of the change in name, or b) details on when such evidence was filed with the EUB.	For a name change to multiple schemes, you may attach a list of the approvals, including the numbers, field and pool, and type of scheme. The EUB requires the current scheme approval name so that staff can effectively conduct appropriate surveillance of the scheme and can update documents and publications made available to the public and industry.

5.2 Change of Approval Holder

5.2.1 Background

In accordance with Section 15.080 of the Oil and Gas Conservation Regulations, the operator of a scheme approved under Section 39 of the Oil and Gas Conservation Act should apply to amend the approval to show the change of holder of the approval if the scheme has been sold or divested.

5.2.2 Requirements for an Application for a Change of Approval Holder (file 3 copies)

Requirements	Comments
1) Approval number.	It is important that companies purchasing new properties in Alberta understand the terms and conditions of the scheme and that they update the appropriate EUB documents. This also enables EUB staff to effectively conduct appropriate surveillance of the scheme. You may use the Transfer of Approval form in Appendix D.
2) Field and pool named on the approval.	
3) Statements by the present holder and the proposed new holder agreeing to the change.	
4) A statement by the proposed new holder stating the circumstances giving rise to the application.	
5) A statement by the proposed new holder stating that he/she is aware of the details of the scheme and is prepared to carry out the scheme.	
6) If the present holder no longer exists, evidence that the proposed new holder is the proper person/company to assume responsibility for the scheme, with a Gazette reference that the present holder is no longer in existence.	

Appendix A References

How to Use This Directive	Energy Resources Conservation Act, Rules of Practice IL 99-4: EUB Enforcement Process, Generic Enforcement Ladder, and Field Surveillance Enforcement Ladder
When to Use Schedule 1	Guide 43: Field and Pool Code List Energy Resources Conservation Act, Section 26
Notification Guidelines	Energy Resources Conservation Act, Section 26 Guide 56: Energy Development Application Guide, Unit 1, Step 4: Emergency Response Plan IL 89-4: Public Involvement in the Development of Energy Resources
Unit 1—Equity	
1.1 Rateable Take	Oil and Gas Conservation Act, Section 36 Decision 85-5 Guide 32: Common Gas Purchaser and Related Matters, Board Policy and Views Decision 91-8 Guide 40: Pressure and Deliverability Testing Oil and Gas Wells
1.2 Common Purchaser	Oil and Gas Conservation Act, Sections 50, 51, 55, and 56 Guide 32: Common Gas Purchaser and Related Matters, Board Policy and Views Decision 91-8
1.3 Common Carrier	Oil and Gas Conservation Act, Sections 48, 55, and 56 Guide 32: Common Gas Purchaser and Related Matters, Board Policy and Views Decision 91-8
1.4 Common Processor	Oil and Gas Conservation Act, Sections 53, 55, and 56 Guide 32: Common Gas Purchaser and Related Matters, Board Policy and Views Decision 91-8
1.5 Compulsory Pooling	Oil and Gas Conservation Regulations, Section 5.005 Oil and Gas Conservation Act, Sections 80, 85, and 86 Examiner Report 91-6 Examiner Report 95-2
1.6 Special Drilling Spacing Units (DSUs)	
Change in Target Area	Oil and Gas Conservation Regulations, Section 4.040(1)
Fractional Section	Oil and Gas Conservation Regulations, Section 4.050(1)
Reduced DSUs	Oil and Gas Conservation Regulations, Section 4.030(3)
Target Areas	Oil and Gas Conservation Act, Section 71(4)
Suspension of DSUs	Oil and Gas Conservation Regulations, Section 5.190

Holding (Common Ownership)	Oil and Gas Conservation Regulations, Section 1.020(2)(4)
Unit 2—Conservation	
2.1 Enhanced Recovery Scheme	Oil and Gas Conservation Act, Section 39(1)(a) Guide 51: Injection and Disposal Wells IL 94-13: Progress Report Requirements – Conventional Recovery Schemes IL 96-2: Progress Report Requirements for Miscible Flood Schemes GB 2000-8: Process Changes to Disposal Well Applications Bulletin 2004-16: Chances to Enhanced Oil Recovery Application Requirements and Review Process Bulletin 2004-30: Directive 065: Resources Applications for Conventional Oil and Gas Reservoirs Enhanced Recovery Scheme—Application Changes Application Form, Requirements, and Process
2.2 Enhanced Oil Recovery Project	*Rescinded*
2.3 Enhanced Recovery Recognition and Good Production Practice	*Rescinded*
2.4 Concurrent Production	Oil and Gas Conservation Act, Section 39(1)(e) Guide 60: Upstream Petroleum Industry Flaring Guide
Unit 3—Production Control	
3.1 Commingled Production	Oil and Gas Conservation Regulations, Sections 3.050 and 3.060 ID 99-1: Gas/Bitumen Production in Oil Sands Areas—Application, Notification, and Drilling Requirements
3.3 Good Production Practice (Primary Pools)	Oil and Gas Conservation Regulations, Section 10.060 Monthly MRL Order Guide 60: Upstream Petroleum Industry Flaring Guide Guide 7-1: Allowables Handbook ID 99-2: Revised Policy on Administration of Oil MRLs and Overproduction
3.4 GOR Penalty Relief	Oil and Gas Conservation Regulations, Section 10.060
3.5 Special MRL	Oil and Gas Conservation Regulations, Section 10.060
3.6 Gas Allowable	Oil and Gas Conservation Regulations, Sections 4.050, 4,070, 10.095, and 10.300 ID 94-2: Revisions to Oil and Gas Well Spacing Administration ID 94-5: Consolidation of Regulations for Off-Target Penalty Factor Determination IL 85-10: Maximum Daily Rate of Production for Gas Wells

Unit 4—Disposal/Storage

4.1 Class I-IV Disposal	Oil and Gas Conservation Act, Sections 39(1)(c) and 39(1)(d) Guide 51: Injection and Disposal Wells Guide 56: Energy and Development Application Guide Guide 58: Oilfield Waste Management Requirements for the Upstream Petroleum Industry GB 2000-8: Process Changes to Disposal Well Applications
4.2 Acid Gas Disposal	Oil and Gas Conservation Act, Section 39(1)(d) Guide 51: Injection and Disposal Wells GB 2000-8: Process Changes to Disposal Well Applications
4.3 Underground Gas Storage	Oil and Gas Conservation Act, Section 39(1)(b) Guide 51: Injection and Disposal Wells

Unit 5—Corporate Changes

5.1 Change of Name of Approval Holder	Oil and Gas Conservation Regulations, Section 15.080
5.2 Change of Approval Holder	Oil and Gas Conservation Regulations, Section 15.080

Note: To obtain current interim directives (IDs), informational letters (ILs), and other EUB documents, visit the EUB Web site (www.eub.gov.ab.ca) or contact EUB Information Services (403-297-8190).

Appendix B Example Letter of Nonobjection

[Date]

[Offset Company]
[Address]

Attention: [Offset Owner]

Dear [Sir/Madam]:

Application for [type of application]__________
[List wells or pool]

[Company X] has applied [or will be applying] to the Alberta Energy and Utilities Board (EUB) for approval to [describe the application]. A copy of the application is attached. If you have questions about this application or if you have any concerns respecting the potential for the application to affect your interest, do not hestiate to contact the undersigned at [telephone number].

You may make a submission to the EUB if you have any concerns regarding the application. Take notice that the EUB may continue to process this application without further notice if no submissions are received on or before [15 working days from date of this letter].

If you do not have any concerns, please indicate your agreement with the application by signing and returning a copy of this letter to the undersigned [fax/telephone number].

Yours truly,

[Applicant]

AGREED TO THIS ______________ DAY OF ______________________, 2000.

____

[Offset Company Representative]

Appendix C

EUB Alberta Energy and Utilities Board

Application for Gas-Oil Ratio (GOR) Penalty Relief
Form O-33

This form is to be used for smaller, less complex pools only. For detailed application requirements, see *Guide 65*, Unit 3: Production Control. A covering letter should state the reason GOR Penalty Relief is being requested and should be made on behalf of all operators in the pool.

Company Name ____________ **On behalf of** (N/A ☐) ____________

Field and Pool Name ____________

Gas Conservation

Is solution gas currently being conserved? Yes ☐ No ☐

If gas conservation is planned for the future, identify the tie-in location and provide an implementation schedule.

____

____

____

____

If gas conservation is not considered feasible, include economic analysis showing capital costs, product price forecasts, total revenue (including liquids), payout time, and rate of return.

____

____

____

____

Performance Characteristics

Base MRL ____________ $m^3/d/well$ Base GOR ____________ m^3/m^3

Well Location (Unique Well Identifier)	On Production Date	Cumulative Oil Production (m^3)	Capability (m^3/d)	GOR (m^3/m^3)

Pool Reserves (company's interpretation)

Area (hectares) ____________

N (10^3 m^3) ____________

R_f ____________

R_f N (10^3 m^3) ____________

Pressure Data

P_i ____________ kPa(ga) P_b ____________ kPa(ga)

Last measured pressure ____________ kPa(ga)

Date ____________ Well ____________

Where appropriate, attach material balance calculations.

(continued)

Application for Gas-Oil Ratio (GOR) Penalty Relief, page 2

Geology

Discuss the potential for further pool development. ______

Recompletion Potential

Comment on recompletion potential or any measures taken to reduce gas production. ______

Enhanced Recovery Potential

Impact on Primary Oil Recovery

Correlative Rights — Include an up-to-date map showing lessee and lessor ownership.

(Note: If pool is multiwell and of mixed ownership, concurrence in writing is required from all operators.)

AGREEMENT TO TRANSFER APPROVAL(S)

BETWEEN ____
(*company name*)
of the City of ______________________________ in the Province of Alberta,

referred to as the **Transferor**, and ________________________ of the City
(*company name*)

of ________________ in the Province of Alberta, referred to as the **Transferee**.

The **Transferor**, who is the holder of Board Approval No. ________, dated the ___day of ____ (or of the attached list of Board Approvals) for a ________________________ scheme,
(*type of scheme(s)*)
for good and valuable consideration, transfers to the **Transferee** the Approval(s) and all the **Transferor's** right and title in the Approval(s).

The **Transferee** agrees to the transfer of the Board Approval (or attached list of Board Approvals), acknowledges that it is aware of the details and conditions of the approved ________________ scheme(s), and agrees to carry out the scheme(s) as approved.
(*type of scheme(s)*)

The address of the **Transferee** in Alberta is
____

____.

Dated at ____________________, on __________________________.
(*city*)

Signature: ____________________
Authorized Representative of Transferor

Signature: ____________________
Authorized Representative of Transferee

Appendix E EUB Staff Contacts*

UNIT 1 – EQUITY

1.1 Rateable Take	Karine Fisher	(403) 297-8490
1.2 Common Purchaser	Karine Fisher	297-8490
1.3 Common Carrier	Karine Fisher	297-8490
1.4 Common Processor	Karine Fisher	297-8490
1.5 Common Pooling	Karine Fisher	297-8490
1.6 Special Drilling Spacing Units	Les Schmidt	297-8547

UNIT 2 – CONSERVATION

2.1 Enhanced Recovery Scheme	Tom Byrnes	297-8479
	Nancy Barnes	297-3556
2.4 Concurrent Production	Nancy Barnes	297-3556
	Tom Byrnes	297-8479
2.5 Pool Delineation and Ultimate Reserves	Tom Byrnes	297-8479
	Nancy Barnes	297-3556

UNIT 3 – PRODUCTION CONTROL

3.1 Commingled Production	Karine Fisher	297-8490
	Hellen Groen	297-3581
3.3 Good Production Practice (Primary Depletion Pool)	Nancy Barnes	297-3556
	Tom Byrnes	297-8479
3.4 Gas-Oil Ratio Penalty Relief	Nancy Barnes	297-3556
	Tom Byrnes	297-8479
3.5 Special Maximum Rate Limitation	Nancy Barnes	297-3556
	Tom Byrnes	297-8479
3.6 Gas Allowable	Les Schmidt	297-8547

UNIT 4 – DISPOSAL/STORAGE

4.1 Class I–IV Disposal	Les Schmidt	297-8547
4.2 Acid Gas Disposal	Joe McIntosh	297-8415
4.3 Underground Gas Storage	Joe McIntosh	297-8415

UNIT 5 – CORPORATE CHANGES

5.1 Change in Name of Approval Holder	Hanif Ladha	297-3531
5.2 Change of Approval Holder	Hanif Ladha	297-3531

* All EUB e-mail addresses are standardized as follows:
firstname.lastname@gov.ab.ca

Appendix F ID 2000-5: Guide 65—Resources Applications Guide for Conventional Oil and Gas Reservoirs

ID 2000–5

June 12, 2000

To: All Oil and Gas Operators

GUIDE 65: RESOURCES APPLICATIONS GUIDE FOR CONVENTIONAL OIL AND GAS RESERVOIRS

This interim directive introduces the Alberta Energy and Utilities Board's (EUB) first edition of a resources applications guide. The guide lists the application information requirements for 21 conventional oil and gas reservoir applications and explains the purpose of these requests. Prior to the issuance of this guide, the information requirements for these applications were found primarily in Part 15 of the Oil and Gas Conservation Regulations. The EUB consulted with a small group of applicants on the content of the guide.

Effective October 1, 2000, applicants must prepare the applications listed in Attachment 1 using *Guide 65*. A Schedule 1 form must accompany these applications to provide the EUB with key information about the applicant, the type of application, the area of application, and the details of any notice to potentially affected parties undertaken by the applicant.

An effective and fair regulatory system must ensure compliance with regulations, which includes application and approval requirements. A description of noncompliant events and enforcement consequences is provided in Attachment 2.

Guide – First Step

This guide is a first step in the ongoing review of conventional oil and gas reservoir applications. Each year the EUB processes about 1500 applications of the types that are the subject of this guide. *Guide 65* brings up to date the EUB's requirements for these applications. It will also serve as a foundation for stakeholder feedback to be used in a comprehensive review of these applications scheduled to begin this fall.

Informed regulatory decisions concerning reservoir matters can require detailed analysis and interpretation of engineering, geological, and economic data. This guide, therefore, is developed on the premise that EUB staff will be conducting technical reviews prior to issuing approvals. The EUB intends to examine the need for and the level of its pre-approval scrutiny in these kinds of applications. This review is expected to establish priorities in its regulation of reservoir developments to ensure proper allocation of EUB resources and to shorten the application decision process.

A plan for conducting a further review of both resources and facilities applications is being developed with input from stakeholders to establish review priorities, as well as a reasonable strategy and schedule for the work. The plan should be completed by year-end.

Coal and oil sands resource developments have legislation separate from that for conventional oil and gas. Nevertheless, the EUB's energy application review plan also applies to applications for these resources. If practical, the EUB will look for process consistency in all its energy applications in its ongoing regulatory review efforts. The current application requirements for coal and oil sands applications are documented in *Guide 2*: *How to Apply for Government Approval of Coal Projects in Alberta* and *Guide 23*: *Guidelines Respecting an Application for a Commercial Crude Bitumen Recovery and Upgrading Project.* Additionally, the application requirements for gas production in oil sands areas are documented in *Interim Directive (ID) 99-1*: *Gas/Bitumen Production in Oil Sands Areas—Application, Notification, and Drilling Requirements.*

Guide Objectives

The requirements for conventional oil and gas reservoir applications have not been updated to reflect current EUB expectations and operations for some time. There is a need to clarify information requirements to assist applicants in filing complete applications. *Guide 65* should result in quicker application turnaround and less time spent dealing with application deficiencies. The guide format chosen allows for explanation of EUB policies and decision criteria. This format should help applicants understand the reasons for requesting certain information and the consequences of not providing this information.

Applicants who have recent experience in filing conventional oil and gas reservoir applications will observe minor changes in requirements or process, with two exceptions. The requirements for giving notice to potentially affected parties is an area where the EUB has historically used discretion to fit individual circumstances. In *Guide 65*, the EUB has included minimum notice expectations and explanations needed to provide applicants with the option of confirming consent or identifying concerns prior to filing an application. Application turnaround may be further accelerated by fully addressing the Energy Resources Conservation Act's Section 29 notice requirements early. Earlier identification of concerns may also assist efforts to resolve problems. The EUB is working on new dispute resolution guidelines, which are intended to assist industry and other stakeholders in this regard. It should be understood, however, that the EUB retains the responsibility for giving notice under Section 29. The EUB will review an applicant's evidence of its notification program to determine if the notice was acceptable and if the minimum notification requirements were adequate.

Another process change that the EUB will adopt is a more rigorous practice of returning applications with significant deficiencies. This practice will permit better allocation of EUB resources to process complete applications.

Regulation Changes

Informational Letter (IL) 89-14 is superseded by *Guide 65* and the EUB will be amending Part 15 of the Oil and Gas Conservation Regulations at a later time.

Further Information

General questions and comments related to *Guide 65* should be directed to the Resources Applications Group at (403) 297-8572 or (403) 297-3382. Detailed questions on specific topics should be directed to the parties listed in Appendix E of the guide. *Guide 65* is available from EUB Information Services (403) 297-8190 and can also be viewed on the EUB Web site: http://www.eub.gov.ab.ca. Accessing the guide from the Web site is recommended, as the electronic version has direct links to other supporting documents.

Jim Dilay

J. D. Dilay, P.Eng.
Board Member

Attachments

Attachment 1 Applications Covered by *Guide 65*

Unit 1 - Equity

Rateable Take
Common Purchaser
Common Processor
Common Carrier
Compulsory Pooling
Special Drilling Spacing Units

Unit 2 - Conservation

Enhanced Recovery Scheme
Enhanced Oil Recovery Project
Enhanced Recovery Recognition and Good Production Practice
Concurrent Production
Pool Delineation and Ultimate Reserves

Unit 3 - Production Depletion

Commingled Production
Good Production Practice (Primary Depletion Pools)
GOR Penalty Relief
Special Maximum Rate Limitation
Gas Allowable

Unit 4 - Disposal

Class I-IV Disposal
Acid Gas Disposal
Underground Gas Storage

Unit 5 - Corporate Change

Change in Name of Approval Holder
Change of Approval Holder

Attachment 2 Surveillance and Enforcement for Resource Applications and Approvals

The EUB conducts surveillance to monitor for regulatory compliance. In cases of regulatory noncompliance, the EUB takes escalating enforcement action in accordance with EUB *Informational Letter (IL) 99-4: EUB Enforcement Process, Generic Enforcement Ladder, and Field Surveillance Enforcement Ladder.*

Confirmed situations of regulatory noncompliance are initially dealt with as a "major" or level-2 noncompliant event. In such cases, the EUB requires the immediate and continued shut-in or suspension of any noncompliant wells until the requisite approval is obtained by the company. Repeat situations within a one-year period are escalated to a higher level of enforcement in accordance with *IL 99-4*. Examples of major regulatory noncompliance include the commencement of injection without approval, unauthorized commingling, unauthorized spacing (i.e., producing more than one well in an approved drilling spacing unit) and unauthorized concurrent production. Where it is clear that a company has shown a "demonstrated disregard" for the regulations, the EUB initially enforces the noncompliant event as a "serious" or level-3 noncompliance.

Noncompliance with approval requirements (i.e., conditions of approval) are enforced as either a "minor" or "major" noncompliant event, in accordance with *IL 99-4*, depending on the significance of the requirement. For example, inadequate voidage replacement in an approved pressure maintenance waterflood scheme would likely be enforced as a "major" noncompliant event because of the potential threat to conservation. This could result in production restrictions being imposed or other consequences necessary to ensure compliance.

Failure to meet reporting requirements (i.e., timing and content) are to be initially enforced as a "minor" noncompliant event in accordance with *IL 99-4*.

Appendix G Feedback Form

The EUB welcomes your comments on *Directive 065: Resources Applications for Conventional Oil and Gas Reservoirs*. Your responses will be considered when the directive is periodically updated or may be noted in frequently asked questions on the EUB Web site or used as feedback information in future re-engineering studies. Please use this feedback form for Schedule 1 and each of the application types contained in the five units and return them with your application or mail or fax them directly to: Resources Applications Group, Alberta Energy and Utilities Board, 640 – 5 Avenue SW, Calgary, Alberta T2P 3G4 (fax: 403 297-2474).

Duplicate this form for repeated use. Thank you for your time and consideration.

Check the topic(s) this feedback form applies to:

Equity

☐ Schedule 1
☐ Notification Guidelines and tables
☐ Rateable Take
☐ Common Purchaser
☐ Common Carrier
☐ Compulsory Pooling
☐ Special Drilling Spacing Unit

Production Controls

☐ Commingled Production
☐ Good Production Practice (Primary Depletion Pool)
☐ Gas-Oil Ratio Penalty Relief
☐ Special Maximum Rate Limitation
☐ Gas Allowable (Amending or Rescinding)

Corporate change

☐ Change in Name of Approval Holder
☐ Change of Holder of Approval

Conservation

☐ Enhanced Recovery Scheme
☐ Concurrent Production
☐ Pool Delineation and Ultimate Reserves

Disposal

☐ Disposal (Class I-IV)
☐ Acid Gas Disposal
☐ Underground Gas Storage

Please provide your responses in the space below:

	Yes	No	Comments
1 I found the language in the directive clear.			
2 I found the instructions easy to follow.			
3 I found it easy to tell what information must be attached to the schedule for each application topic.			

	Yes	No	Comments
4. I found the notification tables easy to understand and use, along with the detailed description contained in the application units.			
5. What changes to Schedule 1 would make the form easier to use or more useful?			
6. Is Schedule 1 useful for submitting more than one application topic at a time?			
7. Would you like to see other requirements that are common in more than one application type combined in one location of the directive, as is done for notification guidelines/process? If yes, which topic?			
8. I found the "comments" provided with the requirements to be clear and useful. (Please provide examples.)			

9. How else can the directive be improved?

10. Additional suggestions and comments:

Appendix H Commingling of Production

- Clarification of Requirements for Area-Based Commingling Applications
- Gas Production
  - Decision Tree for Commingling of Gas Production from Two or More Pools in the Wellbore
  - Explanatory Notes
  - Notification Form: Commingling of Gas Production from Two or More Pools in the Wellbore
- Oil Production
  - Decision Tree for Commingling of Oil Production from Two or More Pools in the Wellbore
  - Explanatory Notes
  - Notification Form: Commingling of Oil Production from Two or More Pools in the Wellbore
- EUB Enforcement Regarding Commingling
- Minor and Major Enforcement Ladders for Commingling Noncompliance

Clarification of Requirements for Area-Based Commingling Applications

- All requirements in *Directive 065* for a commingling application apply to applications for an area- or field-based commingling order.

- The application must apply to specific zones in all portions of the field or contiguous area for which the rationale for commingling of production from the identified zones exists (not just to the applicant's working interest lands).

- The applicant must demonstrate that conservation goals are at least as likely to be achieved through commingling of production as through segregated operations.

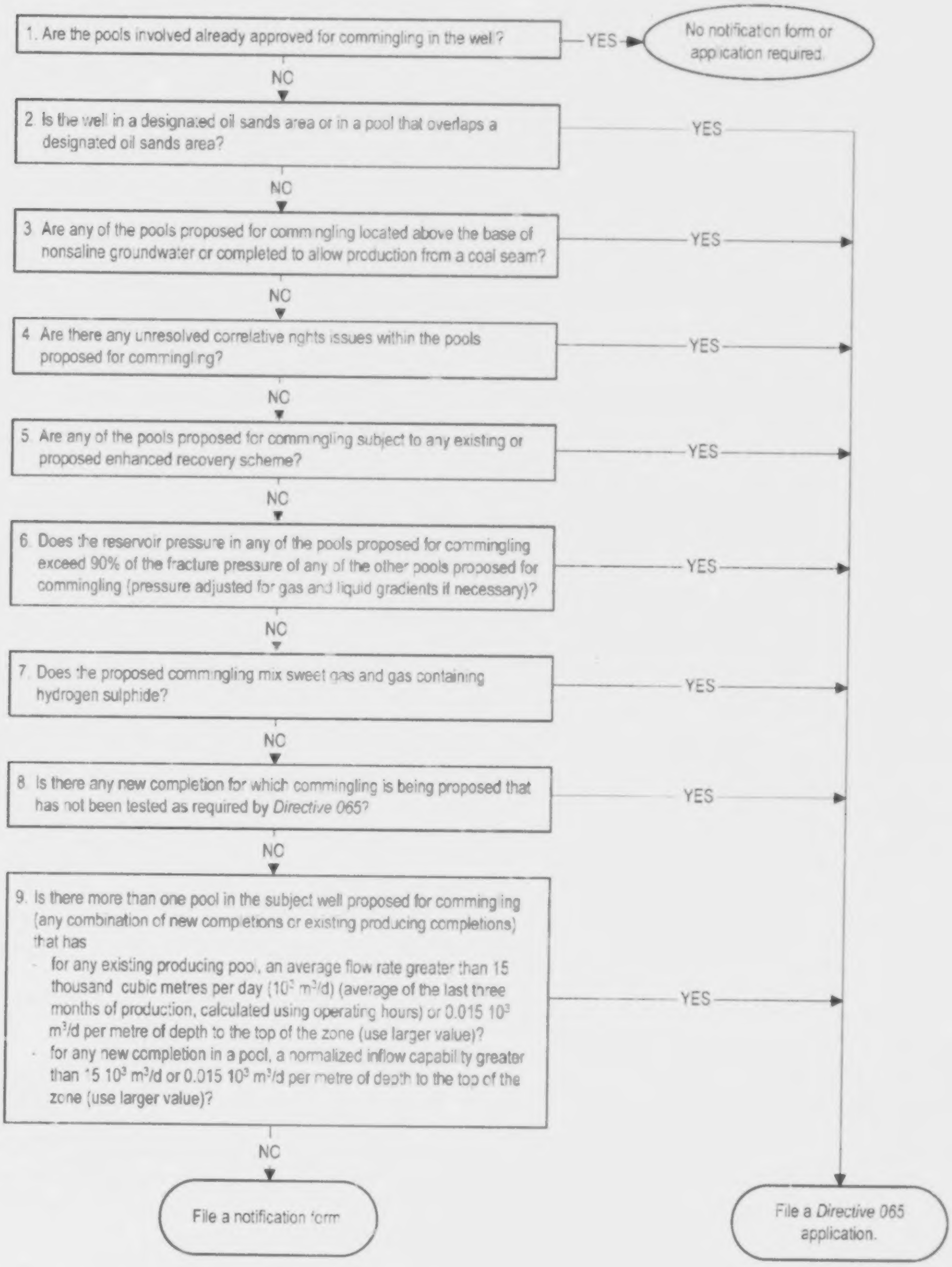
- The applicant must make a commitment to a method of capturing the key reservoir data in a manner acceptable to the EUB.

- The applicant must show that there are sufficient existing data to demonstrate a pattern of production performance in the area for which an application is being made.

- The applicant must include all relevant data for the zone and field/area in question (not just for the applicant's working interest lands) in the application.

- The applicant must confirm that it consulted with other well licensees with production in the same pool or in the same field and zones in the application, and it must identify any outstanding concerns with the proposed commingling strategy.

Decision Tree for Commingling of **Gas Production** from Two or More Pools in the Wellbore*



1. Are the pools involved already approved for commingling in the well?

No notification form or application required.

2. Is the well in a designated oil sands area or in a pool that overlaps a designated oil sands area?

3. Are any of the pools proposed for commingling located above the base of nonsaline groundwater or completed to allow production from a coal seam?

4. Are there any unresolved correlative rights issues within the pools proposed for commingling?

5. Are any of the pools proposed for commingling subject to any existing or proposed enhanced recovery scheme?

6. Does the reservoir pressure in any of the pools proposed for commingling exceed 90% of the fracture pressure of any of the other pools proposed for commingling (pressure adjusted for gas and liquid gradients if necessary)?

7. Does the proposed commingling mix sweet gas and gas containing hydrogen sulphide?

8. Is there any new completion for which commingling is being proposed that has not been tested as required by *Directive 065*?

9. Is there more than one pool in the subject well proposed for commingling (any combination of new completions or existing producing completions) that has
   - for any existing producing pool, an average flow rate greater than 15 thousand cubic metres per day (10^3 m^3/d) (average of the last three months of production, calculated using operating hours) or 0.015 10^3 m^3/d per metre of depth to the top of the zone (use larger value)?
   - for any new completion in a pool, a normalized inflow capability greater than 15 10^3 m^3/d or 0.015 10^3 m^3/d per metre of depth to the top of the zone (use larger value)?

File a notification form

File a *Directive 065* application.

* See Explanatory Notes on next page.

Explanatory Notes: Decision Tree for Commingling of Gas Production from Two or More Pools in the Wellbore

The decision tree applies to cases where well licensees propose to commingle production from pools in the wellbore. It does **not** apply to cases where a well licensee wishes to combine production from pools on the surface while maintaining segregated production in the wellbore. Any proposal to combine gas from pools on the surface is a measurement issue that must be dealt with through the EUB's Operations Group.

The decision tree can be applied in the following cases:

- A well is already producing from segregated pools and the well licensee desires to commingle production from the pools.
- A new well is being completed. In order to make a decision on the commingling of production in the wellbore during completion operations in the field, the well licensee needs to do some work in advance of drilling the well to be able to answer the questions on the decision tree.
- A well is already producing from one or more pools, a new pool is being completed, and the well licensee desires to commingle production.

Although there may be reference to zones and intervals in this document, the basic unit in which commingling is determined is the pool. Several perforated intervals or zones may exist within a pool, and it is on a pool basis that the high-rate and low-rate determinations are made. In the event that a pool has separate tests conducted in more than one interval, the combined tests for these intervals will be used for the high-rate versus low-rate calculation.

The following are clarifications to each item on the decision tree:

1) Are the pools involved already approved for commingling of gas production?

To answer this question, the existing EUB commingling order (MU Order) for the field in question must be checked. These orders are available from EUB Information Services at (403) 297-8190. To use the MU Orders, an evaluation needs to be made as to whether each productive interval involved is part of an existing pool as defined by the EUB and whether multiple intervals represent separate pools. In this regard, the well licensee should consider whether the reservoirs involved are in natural communication or not. The EUB would normally consider any reservoir that is not in natural communication with any other reservoir to be a separate pool. For example, there may be separate pools within the same geological zone. However, in limited cases the EUB has defined multiple productive intervals within a formation as a single pool for administrative convenience.

Factors that should be considered in a decision on whether intervals represent separate pools and what pools are involved include correlation of the productive interval in question with the pool interval of the type well for a defined pool, interface variations, the presence of laterally continuous shales, and pressure differences. The licensee should also understand the EUB pool definitions in the area for the specific zone. These matters should be considered prior to the well licensee completing intervals in a well. Questions may be directed to the EUB's Geology and Reserves Group at (403) 297-8374. **If there is doubt as to what EUB pools are involved or whether the EUB would consider two intervals as one pool or separate pools, the well licensee must assume that there is more than one pool and must proceed to work through the decision tree if commingling is desired.**

As indicated on the decision tree, if the pools involved in the well are already approved for commingling, no further approval for commingling is required. In this case, the normal reporting through the Petroleum Registry of Alberta must indicate that production has been commingled in the wellbore.

2) Is the well in a designated oil sands area or in a pool that overlaps a designated oil sands area?

In order to answer this question, the EUB's existing orders showing designated oil sands areas and, where applicable, the EUB's pool orders must be checked. EUB Orders OSA 1, OSA 2, and OSA 3 are available from EUB Information Services. The EUB has excluded the oil sands areas from the notification path because the issue of gas production in these areas is complex and the processes for dealing with the production of gas reservoirs in contact with bitumen reserves are in a state of evolution. If approval to commingle gas production in a designated oil sands area or from any pool that overlaps a designated oil sands area is desired, the well licensee must make a full application in accordance with this directive.

3) Are any of the pools proposed for commingling located above the base of nonsaline groundwater or completed to allow production from a coal seam?

A well licensee may determine whether any pool proposed for commingling is above the base of nonsaline groundwater from the data provided in EUB *Statistical Series (ST) 55: Alberta's Usable Groundwater Database* or from an Alberta Environment assessment of the base of groundwater. *ST 55* defines an aquifer containing nonsaline groundwater as a stratum capable of producing water with a total dissolved solids content less than 4000 milligrams per litre.

The EUB has a responsibility to ensure that nonsaline groundwater is protected against contamination by saline water. On that basis, where there is a potential for the commingling of saline and nonsaline water, the notification form cannot be used to obtain approval for commingling. If approval is desired to commingle gas where any pool involved is located above the base of groundwater, the well licensee must make a full commingling application and provide justification as to why the proposed commingling will not jeopardize any nonsaline water zone.

Production of gas from coal seams is relatively new in the province and not well understood; therefore, the notification form cannot be used to obtain approval for commingling if any pool proposed for commingling is completed to allow production from a coal seam. If approval to commingle gas in this situation is desired, the well licensee must make a full application in accordance with this directive.

4) Are there any unresolved correlative rights issues within the pools proposed for commingling?

- *Varying Interests*

Production from pools that have varying ownership or royalty interests in the drilling spacing unit must not be commingled unless all parties involved in the spacing unit have agreed.

- *Off-target Wells*

Commingling of production in the wellbore may also be an issue if a well is off target, because commingling will affect the well licensee's ability to obtain segregated pool data, which in turn may adversely affect the ability of offsetting mineral holders to determine the possible effects of the off-target well. For example, the offsetting mineral owner may not be able to adequately judge whether the off-target well is in the same pool as the offsetting mineral owner's well because of a lack of segregated pool pressures.

If a well licensee is considering drilling an off-target well and is also considering commingling production in the wellbore from the outset, it is recommended that the well licensee determine in advance whether such commingling is likely to be an issue with any offsetting mineral holder with a wellbore, so that the question on equity on the decision tree can be accurately answered.

Should commingling in an off-target well occur under the notification provision of the decision tree and subsequently a dispute arise respecting the off-target well, the EUB may require the well licensee to segregate gas from the pools in question so that data can be obtained to resolve the dispute.

- *Notice*
  - A well licensee that has commingled production under the notification provisions of the decision tree must provide notice of the commingling to all parties that may be potentially adversely affected by the commingling. The expectation is that the parties most likely to be adversely affected would be in the eight sections immediately offsetting the well involved. The well licensee must send notice, at the minimum, to the well licensees of all wells, other than abandoned wells, in the eight sections immediately offsetting the well in which commingling has occurred. In addition, the well licensee must make a judgement as to whether parties outside the eight-section area could be potentially adversely affected and, if so, provide notice to those parties also.
  - Any company filing a notification form must retain an information (audit) package, as described in the Enforcement section of this appendix, that fully supports the decision tree involved and the information set out on a notification form. The audit package must be available within five working days upon request from the EUB or any well licensees in the notice areas. When requested, this package must be provided in its entirety, including for those cases where a well has a confidential status.
  - If a well licensee determines that production in any well has been commingled without EUB authorization, the well licensee should contact the EUB Enforcement and Surveillance Section, Resources Applications Group, and this group will take appropriate action.
  - If a dispute arises with an offsetting licensee as to whether commingling should have taken place under the notification provisions of the decision tree, the parties should attempt to resolve the issue through negotiation, appropriate dispute resolution, and other mutually acceptable means. If the dispute is not resolved, either party may contact the EUB for resolution. After review of the matter, the EUB may require that production in the well under dispute be segregated.

    Although it would normally be expected that any concerns raised in response to notice would be brought forward by parties with an interest within the eight sections offsetting the well in question, concerns raised by well licensees outside of that area must be addressed. If the EUB were asked to make a decision in such a case, it would consider the arguments brought forward on their own merits and would not automatically reject the concerns raised solely because the licensee is located outside of the eight sections immediately offsetting the well in which commingling has occurred.

5) Are any of the pools proposed for commingling subject to any existing or proposed enhanced recovery scheme?

There may be concern that conservation may be jeopardized if any pool proposed for commingling is part of an enhanced recovery scheme. The lack of segregation could result in operational difficulties and the loss of data required to properly manage the scheme. In this circumstance, the notification path cannot be used for commingling.

6) Does the reservoir pressure in any of the pools proposed for commingling exceed 90 per cent of the fracture pressure of any of the other pools proposed for commingling (pressure adjusted for gas and liquid gradients if necessary)?

Extreme pressure differences between pools proposed for commingling raises a safety issue in that wellbore control may be jeopardized if gas from a high-pressured reservoir flows into a lower-pressured reservoir that has a well completion or wellhead equipment not designed for such high pressures. The onus is on the well licensee to evaluate this issue. If the reservoir pressure in any of the pools proposed for commingling exceeds 90 per cent of the fracture pressure in any other pools proposed for commingling (with pressure adjusted for gas and liquid gradients in the wellbore if necessary), commingling may not occur using the notification path of the decision tree. If commingling is desired under this scenario, the well licensee must file a full application under *Directive 065* showing that the pools will be isolated during any shut-in periods and demonstrating that casing and cement integrity and wellhead design are adequate for the proposed completion.

7) Does the proposed commingling mix sweet gas and gas containing hydrogen sulphide (H_2S) (sour gas)?

For the notification process, gas with an H_2S content greater than 0.00 mole/kilomole is considered to contain H_2S. This definition is consistent with Table 7.1 in *Guide 56: Energy Development Applications and Schedules*.

The notification path of the decision tree cannot be used for any commingling situation that would result in mixing of sweet gas and gas containing H_2S. If commingling is desired in this scenario, the well licensee must file a complete application for approval to commingle under *Directive 065*.

The notification path of the decision tree may be used for a commingling situation involving two or more pools that all contain H_2S. However, the well licensee contemplating commingling production from gas pools containing H_2S using the notification path should be aware that commingling production from two or more pools containing H_2S could possibly increase the maximum H_2S release rate that could occur from a well, which may increase the size of the emergency planning zone and may change the setback level designation. It is the well licensee's responsibility to ensure that the emergency planning zone and the setback level designation in this scenario are amended to reflect any commingled production operations at the well, all safety-related matters have been addressed, and affected members of the public have been informed.

8) Is there any new completion for which commingling is being proposed that has not been tested as required by *Directive 065*?

All new completions must be tested in the subject well, as noted below in item 9.

9) Do the pools involved in the well meet the flow rate criteria to allow use of the notification form?

a) For existing producing wells, if production has been proceeding on a segregated basis from more than one pool, commingling may occur using the notification provisions of the decision tree if there is not more than one pool in the well involved with an average production rate greater than 15 10^3 m^3/d calculated using actual operating hours over a three-month period or 0.015 10^3 m^3/d per metre of depth to the top of the zone (use the larger value).

b) For new completions, commingling may occur using the notification provisions of the decision tree if there is not more than one pool in the well involved with a normalized inflow capability (NIC) greater than 15 10^3 m^3/d or 0.015 10^3 m^3/d per metre of depth to the top of the zone (use the larger value). In order to maintain a level playing field for all well licensees, all parties must calculate the NIC using the method noted below, with the data and calculations reported on the notification form.

c) For the case where gas from a new completion is proposed to be commingled with gas from two or more pools that are already approved for commingling:

- Any new completion must be tested separately in the well and must be a low-rate interval, as discussed below.
- If the previously approved commingled pools have been producing in the well, the combined commingled production data may be used on the notification form.
- If the previously approved commingled pools are a new completion in the well, the previously approved commingled pools may be tested as a single combined pool, or representative production or test data for the same commingled pools from nearby wells may be used for the notification process.

If representative production or test data from nearby wells are used, the specific well(s) and data used must be included in the audit package.

d) The following are the testing requirements associated with new completions:

Testing Objectives

- to capture key reservoir pressure and productivity data
- to determine whether the zone or interval is "low rate"

Testing Requirements

- The minimum segregated test requirements for any pool are an adequately recorded surface flow rate, with corresponding bottomhole flowing and static reservoir pressures and temperatures.
- Bottomhole flowing and static reservoir pressures, except for dry gas pools, must be measured at sandface.
- For dry gas pools only, the wellhead static and flowing pressures may be used to calculate the NIC (see below for NIC calculation). A dry gas pool is defined as having no fluid level above the top perforations. To support the use of a wellhead pressure, a fluid level measurement must be taken and provided in the audit package.
- Sampling of gas and water must be conducted for each new completion in the subject well in accordance with Section 11.070(2) of the *Oil and Gas Conservation Regulations* (OGCR) to obtain compositional analysis and address compatibility issues.
- If stimulation is to be carried out, the test must be done after stimulation and cleanup when an appropriate amount of completion fluid is recovered. A summary of load fluid recoveries must be kept in the well licensee's file and submitted to the EUB if requested. The material must **not** be filed with the notification form, which is to be sent to the EUB Resources Applications Group

- Tests must consist of a sustained flow period of not less than four hours, followed by a shut-in period at least four times as long as the previous flow period, except where a reliable bottomhole measurement (at or close to the sandface) of the static reservoir pressure was obtained prior to the flow test. In that case, no shut-in is required.

- An acceptable measurement of static pressure would typically include that the well be cased, cleaned up, and then shut in for a reasonable amount of time before the pressure is taken and the flow test is done. A reasonable amount of time for shut-in would be a function of the quality of the reservoir and the duration of the cleanup. Shut-in of the well is to reduce wellbore storage effects and to enhance the likelihood of adequately determining the parameters for the calculation of normalized inflow capability. There is no provision for a waiver of pressure and flow testing requirements for new completions under the notification process.

- In cases where the EUB has defined multiple productive intervals within a formation as a single pool for administrative convenience or through previous commingling approval, the pressure for such a pool should be measured at about the midpoint of perforations within the pool. The flow rate for this type of pool should represent production from all of the perforations within the administrative or commingled pool.

Calculations for Determining "High Rate" Versus "Low Rate"

- Depth and NIC are the determinants of whether a zone or interval is high rate or low rate in the well. The NIC is an approximation of a transient sandface Absolute Open Flow (AOF).

- Data requirements are a final gas rate, final sandface flowing pressure, and sandface shut-in pressure.

- The top perforation in a given pool (metres at kelly bushing [mKB] True Vertical Depth) is the depth used in the calculation of the depth-related flow rate.

- The flow rates are for gas at standard conditions.

- The normalized inflow capability must be determined by test for each pool proposed for commingling.

- For each tested pool in the well: if the NIC is less than or equal to 15 10^3 m^3/d or less than or equal to 0.015 10^3 m^3/d per metre of depth (KB) to the top perforation, the classification is low rate for the purposes of this application. Otherwise the classification is high rate.

- The NIC is calculated by using the following simplified equation (the Rawlins-Schellhardt equation is also applicable):

  $NIC = q^* Psi^2/(Psi^2 - Pwf^2)$,
  where
  q = final flow rate (10^3 m^3/d)
  Psi = initial reservoir pressure (kilopascals absolute [kPaa])
  Pwf = final flowing pressure upstream of any chokes (kPaa)

  Psi can come from various sources (see *Guide 40: Pressure and Deliverability Testing Oil and Gas Wells*, Section 5), or the final (highest) recorded buildup pressure can be used.

e) For a combination of new completions and existing producing zones, if there is an existing pool being produced from a well and the well licensee then proceeds with a new completion in a different pool, the following rates are used to determine if commingling may occur under the notification path of the decision tree:

- For the existing pool, the average of the **last** three months of production, calculated using operating hours to obtain an average production rate. The three months do not need to be consecutive, nor is there a minimum time for production in a given month.

- For the new completion, the normalized inflow capability determined as per (b) above.

The rates are then compared with the 15 10^3 m^3/d or 0.015 10^3 m^3/d per metre of depth to the top of the zone (use the larger value) limit, separating low rate and high-rate pool designations.

f) If both NIC and production data are available for a pool, only the production data should be entered on the notification form.

g) Subsequent production and testing:

- The subsequent commingled production stream must not exceed:

  - for a combination of only low-rate pools, the sum of the depth-related flow rates or 15 10^3 m^3/d, whichever is larger, for all pools, or

  - for a combination of one high-rate pool with one or more low-rate- pools, the sum of the average flow rate or NIC rate for the high-rate pool and the larger of 15 10^3 m^3/d or the depth-related flow rates for the low-rate pools.

  If the commingled production stream exceeds the above-noted rates, the well licensee will be subject to the enforcement actions set out in the Enforcement section of this document and will be required to retest the well and file a conforming application or undertake segregation of the producing intervals. The onus is on the licensee to ensure compliance.

- Commingling and notification using the decision tree do not eliminate the requirement that a well must be tested as required by *Guide 40*. That is, a well with commingled production must be tested to satisfy the requirements of *Guide 40*.

Submission of Test Data

With the exception of the NIC information included on the notification form, all test and supporting information must continue to be filed with the appropriate EUB group.

The test information and audit package must **not** be filed with the notification form.

EUB Alberta Energy and Utilities Board

Notification Form
Commingling of Gas Production from Two or More Pools in the Wellbore[1]
(page 1 of 2)

Boxed area for use by EUB only
Review completed by: ____________________ Date: ____________
Authorization for Order by: ____________________ Date: ____________ Application No. ____________

Any company filing a notification form must retain an information (audit) package that fully supports the information set out below. The audit package must be available within 5 working days on request by the EUB and well licensees in the notification area.

Attach Schedule 1 from EUB *Directive 065* as the cover page(s) for this form.

Field name ____________________

Well/intervals from which production is commingled in the wellbore:

				EUB pool designation (Boxed area for use by EUB only)	
Unique well identifier	Interval, TVD (mKB) and formation name	Depth-related flow rate[2] (10^3 m^3/d)	Pool name (if designated)	Pool name (new)	Effective date of pool designation

Flow rate information:	**Flow rate calculation for any producing pool[3]**				**Normalized inflow capability (NIC) for any new completion[4]**			
Interval, TVD (mKB)	Average flow rate (10^3 m^3/d)	Total hours	Total volume (10^3 m^3)	Specific months and year of production data	NIC (10^3 m^3/d)	q (10^3 m^3/d)	Psi (kPaa)	Pwf (kPaa))

Are you using sandface pressures calculated from wellhead measurements for calculation of the NIC for any interval? Yes ___ No ___
If yes, have you completed a fluid level measurement? Yes ___ No___

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Notification Form
Commingling of Gas Production from Two or More Pools in the Wellbore
(page 2 of 2)

Notice of commingling of production to offsetting well licensees:

A copy of this form completed in full is being sent to the licensees of all wells, other than abandoned wells, in the eight sections immediately offsetting the subject section, as listed below, and to other potentially adversely affected parties, also listed below, at the same time as the completed form is filed with the EUB.

No notice of commingling was sent out because

- there are no offsetting wells_____
- all offsetting wells are licensed to the same owner as the subject well____
- other (specify reason) ______________________________

Is hydrogen sulphide (H_2S) present in any of the pools proposed for commingling? Yes ___ No ____

[1] To qualify for approval for commingling through notification, the well licensee must meet all the requirements of the decision tree set out in EUB *Directive 065*. The data from which this summary is obtained must be filed with the EUB through the usual channels and be available for review but must not be attached to this form. In addition, full gas and fluid analyses must be competed and filed with the EUB but should not be attached to this form.

[2] Enter the greater of 15 thousand cubic metres per day (10^3 m^3/d) or the depth-related flow rate (10^3 m^3/d) = True Vertical Depth (TVD, in mKB) x 0.015.

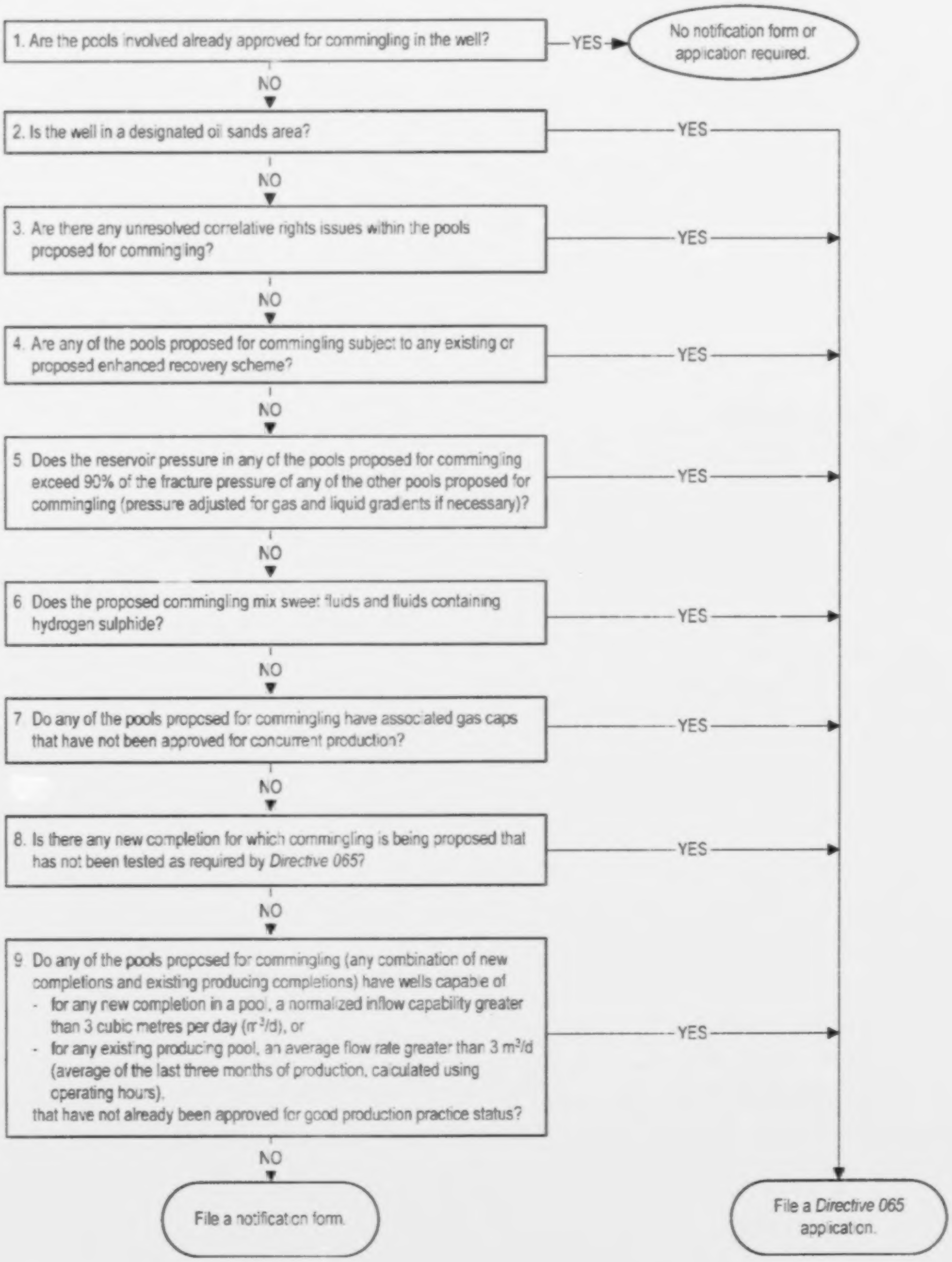
[3] Average flow rate for last three months of production, in 10^3 m^3/d, calculated on the basis of operating hours, data provided must be consistent with monthly production information provided to EUB as available on the public record.

[4] The normalized inflow capability (NIC) for any new completion in a pool must be calculated in accordance with the procedures noted in *Directive 065*, using the following formula

$NIC = q * Psi^2 / (Psi^2 - Pwf^2)$, where NIC = normalized inflow capability (10^3 m^3/d)
q = final top hole flow rate (10^3 m^3/d)
Psi = final bottomhole shut-in pressure (kilopascals absolute [kPaa])
Pwf = final bottomhole flowing pressure (kPaa)

App-Res-01-2004-12

Decision Tree for Commingling of **Oil Production** from Two or More Pools in the Wellbore*



1. Are the pools involved already approved for commingling in the well?

No notification form or application required.

2. Is the well in a designated oil sands area?

3. Are there any unresolved correlative rights issues within the pools proposed for commingling?

4. Are any of the pools proposed for commingling subject to any existing or proposed enhanced recovery scheme?

5. Does the reservoir pressure in any of the pools proposed for commingling exceed 90% of the fracture pressure of any of the other pools proposed for commingling (pressure adjusted for gas and liquid gradients if necessary)?

6. Does the proposed commingling mix sweet fluids and fluids containing hydrogen sulphide?

7. Do any of the pools proposed for commingling have associated gas caps that have not been approved for concurrent production?

8. Is there any new completion for which commingling is being proposed that has not been tested as required by *Directive 065*?

9. Do any of the pools proposed for commingling (any combination of new completions and existing producing completions) have wells capable of
   - for any new completion in a pool, a normalized inflow capability greater than 3 cubic metres per day (m^3/d), or
   - for any existing producing pool, an average flow rate greater than 3 m^3/d (average of the last three months of production, calculated using operating hours),

   that have not already been approved for good production practice status?

File a notification form.

File a *Directive 065* application.

* See Explanatory Notes on next page

Explanatory Notes: Decision Tree for Commingling of Oil Production from Two or More Pools in the Wellbore

The decision tree applies to cases where well licensees propose to commingle production from pools in the wellbore. It does **not** apply to cases where a well licensee wishes to combine production from pools on the surface while maintaining segregated production in the wellbore. Any proposal to commingle oil from pools on the surface is a measurement issue that must be dealt with through the EUB's Operations Group.

The decision tree can be applied in the following cases:

- A well is already producing from segregated pools and the well licensee desires to commingle production from the pools.
- A new well is being completed. In order to make a decision on the commingling of production in the wellbore during completion operations in the field, the well licensee needs to do some work in advance of drilling the well to be able to answer the questions on the decision tree.
- A well is already producing from one or more pools, a new pool is being completed, and the well licensee desires to commingle production.

Although there may be reference to zones and intervals in this appendix, the basic unit in which commingling is determined is the pool. Several perforated intervals or zones may exist within a pool, and it is on a pool basis that the high-rate and low-rate determinations are made. In the event that a pool has separate tests conducted in more than one interval, the combined tests for these intervals will be used for the high-rate versus low-rate calculation.

The following are clarifications to each item on the decision tree:

1) Are the pools involved already approved for commingling of oil production?

To answer this question, the existing EUB commingling order (MU Order) for the field in question must be checked. These orders are available from EUB Information Services at (403) 297-8190. To use the MU Orders, an evaluation needs to be made as to whether each productive interval involved is part of an existing pool as defined by the EUB and whether multiple intervals represent separate pools. In this regard, the well licensee should consider whether the reservoirs involved are in natural communication or not. The EUB would normally consider any reservoir that is not in natural communication with any other reservoir to be a separate pool. For example, there may be separate pools within the same geological zone. However, in limited cases, the EUB has defined multiple productive intervals within a formation as a single pool for administrative convenience.

Factors that should be considered in a decision on whether intervals represent separate pools and what pools are involved include correlation of the productive interval in question with the pool interval of the type well for a defined pool, interface variations, the presence of laterally continuous shales, and pressure differences. The licensee should also understand the EUB pool definitions in the area for the specific zone. These matters should be considered prior to the well licensee completing intervals in a well. Questions may be directed to the EUB's Geology and Reserves Group at (403) 297-8374. **If there is doubt as to what EUB pools are involved or whether the EUB would consider two intervals as one pool or separate pools, the well licensee must assume that there is more than one pool and must proceed to work through the decision tree if commingling is desired.**

As indicated on the decision tree, if the pools involved in the well are already approved for commingling, no further approval for commingling is required. In this case, the normal reporting through the Petroleum Registry of Alberta must indicate that production has been commingled in the wellbore.

2) Is the well in a designated oil sands area?

In order to answer this, the EUB's existing map showing designated oil sands areas must be checked. EUB Orders OSA 1, OSA 2, and OSA 3 are available from EUB Information Services. Because the issue of gas production in oil sands areas is complex and the processes for dealing with the production of gas reservoirs in contact with bitumen reserves are in a state of evolution, with ongoing stakeholder discussions, the EUB has excluded any commingling in the oil sands areas from the notification path. If approval to commingle production in a designated oil sands area is desired, the well licensee must make a full application in accordance with this directive.

3) Are there any unresolved correlative rights issues within the pools proposed for commingling?

- *Varying Interests*

Production from pools that have varying ownership or royalty interests in the drilling spacing unit must not be commingled unless all parties involved in the spacing unit have agreed.

- *Off-target Wells*

Commingling of production in the wellbore may also be an issue if a well is off target, because commingling will affect the well licensee's ability to obtain segregated pool data, which in turn may adversely affect the ability of offsetting mineral holders to determine the possible effects of the off-target well. For example, the offsetting mineral owner may not be able to adequately judge whether the off-target well is in the same pool as the offsetting mineral owner's well because of a lack of segregated pool pressures.

If a well licensee is considering drilling an off-target well and is also considering commingling production in the wellbore from the outset, it is recommended that the well licensee determine in advance whether such commingling is likely to be an issue with any offsetting mineral holder with a wellbore, so that the question on equity on the decision tree can be accurately answered.

Should commingling in an off-target well occur under the notification provision of the decision tree and a dispute subsequently arise respecting the off-target well, the EUB may require the well licensee to segregate oil from the pools in question so that data can be obtained to resolve the dispute.

- *Notice*
  - A well licensee that has commingled production under the notification provisions of the decision tree must contact the well licensees of all wells, other than abandoned wells, within the pool involved and in the eight quarter sections immediately offsetting the well in which commingling has occurred.
  - Any company filing a notification form must retain an information (audit) package, as described in the Enforcement section of this appendix, that fully supports the decision tree involved and the information set out on a notification form. The audit package must be available within five working days upon request from the EUB or any well licensees in the notice areas. When requested, this package must be provided in its entirety, including for those cases where a well has a confidential status.

- If an offset-well licensee determines that production in a well has been commingled without EUB authorization, the well licensee should contact the EUB Enforcement and Surveillance Section, Resources Applications Group, and this group will take appropriate enforcement action.
- If a dispute arises with an offsetting licensee as to whether commingling should have taken place under the notification provisions of the decision tree, the parties should attempt to resolve the issue through negotiation, appropriate dispute resolution, and other mutually acceptable means. If the dispute is not resolved, either party may contact the EUB for resolution. After review of the matter, the EUB may require that production in the well under dispute be segregated.

Although it would normally be expected that any concerns raised in response to notice would be brought forward by parties with an interest within the pool area or within the eight quarter sections offsetting the well in question, concerns raised by well licensees outside of that area must be addressed. If the EUB were asked to make a decision in such a case, it would consider the arguments brought forward on their own merits and would not automatically reject the concerns raised solely because the licensee is located outside of the pool area or the eight quarter sections immediately offsetting the well in which commingling has occurred under the notification provisions of the decision tree.

4) Are any of the pools proposed for commingling subject to any existing or proposed enhanced recovery scheme?

The notification path of the decision tree cannot be used for commingling that would involve a pool that is under enhanced recovery. There may be conservation concerns that arise if any pool proposed for commingling is part of an enhanced recovery scheme. The lack of segregation could result in operational difficulties and the loss of data required to properly manage the scheme.

5) Does the reservoir pressure in any of the pools proposed for commingling exceed 90 per cent of the fracture pressure of any of the other pools proposed for commingling (pressure adjusted for gas and liquid gradients if necessary)?

Extreme pressure differences between pools proposed for commingling raises a safety issue in that wellbore control may be jeopardized if fluids from a high-pressured reservoir flow into a lower-pressured reservoir that has a well completion or wellhead equipment not designed for such high pressures. The onus is on the well licensee to evaluate this issue. If the reservoir pressure in any of the pools proposed for commingling exceeds 90 per cent of the fracture pressure in any other pools proposed for commingling (with pressure adjusted for gas and liquid gradients in the wellbore if necessary), commingling may not occur using the notification path of the decision tree. If commingling is desired under this scenario, the well licensee must file a full application under *Directive 065* showing that the pools will be isolated during any shut-in periods and demonstrating that casing and cement integrity and wellhead design are adequate for the proposed completion.

6) Does the proposed commingling mix sweet fluids with fluids containing hydrogen sulphide (H_2S)?

For the notification process, oil with an H_2S content greater than 0.00 mole/kilomole is considered to contain H_2S.

The notification path of the decision tree cannot be used for any commingling situation that would result in mixing of sweet fluids and fluids containing H_2S. If commingling is desired in this scenario, the well licensee must file a complete application for approval to commingle under *Directive 065*. The application must show that there will not be any adverse effects from commingling sweet fluids and fluids containing H_2S. For example, the licensee must demonstrate that the fluids containing H_2S will not flow into the sweet pool either while production is occurring or while the well is shut in for any reason and that commingling will not result in any production issues relating to the fluids containing H_2S that will either adversely affect ultimate recovery from the pools or impact safe surface production operations.

The notification path of the decision tree may be used for a commingling situation involving two or more pools that all contain H_2S. However, the well licensee contemplating commingling production from oil pools containing H_2S using the notification path should be aware that commingling production from two or more sour pools could possibly increase the maximum H_2S release rate that could occur from a well, which may increase the size of the emergency planning zone and may change the setback level designation. It is the well licensee's responsibility to ensure that the emergency planning zone and the setback level designation in this scenario are amended to reflect any commingled production operations at the well, that all safety-related matters have been addressed, and that affected members of the public have been informed.

7) Do any of the pools proposed for commingling have associated gas caps that have not previously been approved for concurrent production?

The notification path of the decision tree cannot be used for commingling that would involve pools with associated gas caps that have not been previously evaluated for the appropriateness of concurrent production. There are equity and conservation issues that must be addressed prior to commingling approval. Pools that are approved for concurrent production are listed in the EUB's Maximum Rate Limitation (MRL) Order for the current month.

8) Is there any new completion for which commingling is being proposed that has not been tested as required by *Directive 065*?

All new completions must be tested in the subject well, as noted below in item 9.

9) Do any of the pools proposed for commingling (any combination of new completions and existing producing completions) have wells capable of

   - for any new completion in a pool, a normalized inflow capability greater than 3 cubic metres per day (m^3/d), or

   - for any existing producing pool, an average flow rate greater than 3 m^3/d (average of the last three months of production, calculated using operating hours; the three months do not need to be consecutive, nor is there a minimum time for production in a given month),

   that have not already been approved for good production practice (GPP) status?

The EUB requires operators to test, investigate, and implement, where feasible and in the public interest, the optimum depletion management plan for oil pools. While very low oil well production rates are an important consideration in granting GPP, marginal production must be widespread on a pool-wide basis. A single low-rate oil well is not enough to trigger multiwell pool commingling under the notification path. Similar optimization questions for gas pools are rare; thus, it is expected that the notification path will be appropriate more often for commingling gas pools than for oil pools.

Pools that have oil wells capable of producing more than 3 m^3/d are considered to have potential for an enhanced recovery scheme. This potential will have already been addressed if the pool was previously approved for GPP status. Pools approved for GPP status are listed in the EUB's MRL Order for the current month.

For a new well, commingling may occur using the notification path of the decision tree if the well intervals proposed for commingling meet the noted condition. In order to maintain a level playing field for all well licensees, all parties must calculate the wellhead normalized flow rate using the method noted below, with the data and calculations reported on the notification form.

Testing of Existing Producing Pools

- Notification of commingling for specific existing producing pools can be made using data from segregated production data.

- For the purposes of commingling using the notification form, a pool is considered low rate if its production is no more than 3 m^3/d while the well is producing in a pumped-off fashion. Evidence to support the contention that the well is pumped off must be kept in the well licensee's file and submitted to the EUB if requested.

Testing of New Pools

Testing Objectives

- to capture key reservoir pressure and productivity data

- to determine whether the pool is "low rate" for the purposes of allowing commingling

Testing Requirements

- A swab rate must be determined by test for each pool proposed for commingling, with the swab pulled within 25 m of the perforations.

- The minimum segregated test requirements for any pool are an adequately recorded surface flow rate (final swabbing rate over a sustained swab period of at least four hours), with a corresponding bottomhole flowing pressure (calculated), temperature, and static reservoir pressure measured in accordance with EUB *Guide 40: Pressure and Deliverability Testing Oil and Gas Wells* standards (Section 4.2).

- There is no provision for a waiver of pressure and flow testing requirements for new completions under the notification process.

- Sampling of gas and fluids must be conducted for each new completion in the subject well in accordance with Section 11.070(2) of the OGCR to obtain compositional analyses and address compatibility issues.

Calculations for Determining "High Rate" Versus "Low Rate"

- The determinant of whether a pool is high rate or low rate in the well is the normalized inflow capability.

- The NIC can be calculated using the following formula:

  NIC = q* Psi/(Psi-Pwf),
  where
  q = final swab rate (m^3/d)
  Psi = initial reservoir pressure (kPaa)
  Pwf = final flowing pressure (kPaa)

  Pwf and q are measured at the same time and represent the average values at the end of the flow period.

  Psi can come from various sources (see *Guide 40*, Section 5), or the final (highest) recorded buildup pressure can be used.

- For each tested pool in the well: if the NIC is less than or equal to 3 m^3/d, the classification is low rate. Otherwise the classification is high rate.

- To qualify as low rate, the following additional testing conditions apply:

  - If stimulation is to be carried out, the test must be done after stimulation and cleanup when an appropriate amount of completion fluid is recovered. A summary of load fluid recoveries must be kept in the well licensee's file and submitted to the EUB if requested.

  - The test must consist of a sustained swab period (at least four hours in duration) and a buildup period at least four times the producing period to determine the initial reservoir pressure.

Subsequent Production and Testing

- If the subsequent commingled production stream exceeds the sum of rates reported for the pools on the notification form in any month, the well licensee will be subject to the enforcement actions set out in the Enforcement section of this appendix. The onus is on the licensee to ensure compliance.

- Commingling and notification using the decision tree do not eliminate the requirement that a well must be tested as required by *Guide 40*. That is, a well with commingled production must be tested to satisfy the requirements of *Guide 40*.

Submission of Test Data

With the exception of the NIC information included on the notification form, all test and supporting information must continue to be filed with the appropriate EUB group.

The test information and audit package must **not** be filed with the notification form.

EUB Alberta Energy and Utilities Board

Notification Form
Commingling of Oil Production from Two or More Pools in the Wellbore[1]
(page 1 of 2)

Boxed area for use by EUB only
Review completed by ____________________ Date: ____________
Authorization for Order by: ____________________ Date: ____________ Application No. ____________

Any company filing a notification form must retain an information (audit) package that fully supports the information set out below.
The audit package must be available within 5 working days on request by the EUB and well licensees in the notification area.

Attach Schedule 1 from EUB *Directive 065* as the cover pages(s) for this form.

Well/intervals from which production is commingled in the wellbore:

Field name ____________________

			EUB Pool Designation (Boxed area for use by EUB only)	
Unique well identifier	Interval, TVD (mKB) and formation name	Pool name (if designated)	Field/pool name (new)	Effective date of pool designation

Flow rate information:	**Flow rate calculation for any producing pool[2]**				**Normalized inflow capability for any new completion[3]**			
Interval (mKB)	Average flow rate (m^3/d)	Total hours	Total volume (m^3)	Specific months and year of production data	NIC (m^3/d)	q (m^3/d)	Psi (kPaa)	Pwf (kPaa)

App-Res-02-2004-12

Notification Form
Commingling of Oil Production from Two or More Pools in the Wellbore
(page 2 of 2)

Notice of commingling of production to offsetting well licensees:

A copy of this form completed in full is being sent to all licensees of all wells, other than abandoned wells, as listed below, within the pools involved and the eight quarter sections immediately offsetting the well in which commingling has occurred at the same time as the completed form is filed with the EUB:

______________________ ______________________ ______________________ ______________________
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______________________ ______________________ ______________________ ______________________

No notice of commingling was sent to the offsetting well licensees because

- there are no offsetting wells______
- all offsetting wells are licensed to the same owner as the subject well____
- other (specify reason) ____

Is hydrogen sulphide (H_2S) present in any of the pools proposed for commingling? Yes ___ No ____

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[1] To qualify for approval for commingling through notification, the well licensee must meet all the requirements of the decision tree set out in EUB Directive 065. The data from which this summary is obtained must be filed with the EUB through the usual channels and be available for review but must not be attached to this form. In addition, full gas and fluid analyses must be competed and filed with the EUB but should not be attached to this form.

[2] Average flow rate for last three months of production, in cubic metres per day (m^3/d), calculated on the basis of operating hours; data provided must be consistent with monthly production information provided to EUB as available on the public record.

[3] The normalized inflow capability (NIC) for any new completion in a pool must be calculated in accordance with the procedures noted in *Directive 065*, using the following formula:

$NIC = q * Psi / (Psi - Pwf)$, where
NIC = normalized inflow capability (m^3/d)
q = final top hole flow rate (m^3/d)
Psi = final shut-in bottomhole pressure (kilopascals absolute [kPaa])
Pwf = final flowing bottomhole pressure (kPaa)

App-Res-02-2004-12

EUB Enforcement Regarding Noncompliance Respecting Notification Forms and Unauthorized Commingling in the Wellbore

In order to maintain a level playing field for all parties, the EUB considers it important that all licensees follow the same rules. The EUB conducts surveillance to monitor for regulatory noncompliance respecting the notification process and unauthorized commingling. Enforcement is carried out in accordance with Attachment 2 to *Interim Directive (ID) 2000-5: Guide 65: Resources Applications Guide for Conventional Oil and Gas Reservoirs* and the Generic Enforcement Ladder in *Informational Letter (IL) 99-4: EUB Enforcement Process, Generic Enforcement Ladder, and Field Surveillance Enforcement Ladder*. For noncompliances related to commingling, the EUB has identified two separate and distinct audit/inspection categories: "Unauthorized Commingling – Notification Process" and "Unauthorized Commingling."

Disclosure of unauthorized commingling must be made to the Enforcement and Surveillance Section of the Resources Applications Group. A commingling application is not considered voluntary disclosure of unauthorized commingling.

Audits of Notification Forms

On June 23, 2003, the EUB introduced a notification process that may be used to obtain approval for commingled production of two or more pools in the wellbore in certain circumstances. Any company filing a notification form must retain an information (audit) package that fully supports the decision tree involved and the information set out on a notification form for a minimum period of one year following submission of the notification form. The audit package must be available within five working days upon request from the EUB or any well licensee in the notification areas. When requested, this package must be provided in its entirety, including in those cases where a well has a confidential status. The EUB considers that the notification process is similar to a full *Directive 065* application in this regard, in that all information in such an application is considered to be public as soon as the application is filed and the application must include relevant data, even for a confidential well.

A complete audit package includes the following information:

- If the top of the perforations for any gas zones are less than 600 m in depth, supporting information or data to confirm that the zones are below the base of nonsaline groundwater. The actual depth of the groundwater or a copy of the Alberta Environment document must be provided.

- In the event that there are varying interests in the drilling spacing unit, documentation to confirm that all parties involved in the spacing unit have no objections to the proposed commingling.

- Documentation to confirm that notification has been made, at the minimum, to the well licensees of all nonabandoned wells (including disposal) in the eight sections (gas) or eight quarter sections (oil) immediately offsetting the well in which commingling has occurred. Nonabandoned wells include suspended and recently drilled wells.

- A complete copy of the flow and pressure tests conducted to obtain the normalized inflow capability (new completions only). A summary showing a sustained flow period of not less than four hours, followed by a shut-in of at least four times the flow is required under the notification process. (The only exception for not having the required shut-in is if the licensee has obtained a reliable measurement of static reservoir pressure in advance.)

- A summary showing the final production rate, final sandface flowing pressure, and sandface shut-in pressure (new completions only).
- If the sandface pressures are calculated from wellhead measurements, a fluid shot to establish that the pool is dry gas (i.e., test data to support that there is no liquid at the top of the perforations).
- If representative production or test data from nearby wells are used, the specific well(s) and data used.
- A calculation showing how the normalized inflow capability given on the notification form was obtained using the data involved (new completions only).
- A summary of the amount of load fluid used, the amount recovered, and the total remaining for each new zone.
- Evidence to support the contention that an oil well is pumped off when production rate is being determined (oil only).
- Gas, oil (fluid), and water analyses, where applicable, for each pool in the well, in accordance with *Guide 40*, Section 4.8. Samples must be taken from the applied-for well if the well is currently undefined and outside the existing pool boundary.

All notification forms submitted to the EUB are potential audit candidates. A notification form may be randomly selected by computer or judgementally selected by the EUB based on factors such as well location, the applicant's prior history of errors on notification forms, and the applicant's recent compliance history in other Resources Applications audit/inspection categories. If a notification form is found to be noncompliant (i.e., fails the audit), the EUB will proceed with enforcement action. In addition, the EUB will require immediate corrective action (i.e., the shut-in of any noncompliant well) and may audit all similar notification forms submitted by the applicant over the previous twelve months. This follow-up audit will be considered under the umbrella of the initial enforcement action.

Minor Enforcement[1] Ladder for Commingling Noncompliance

Noncompliance Item	Corrective Action
Error on notification form.	Require the submission of a corrected notification form within 5 working days.
Failure to file a complete audit package in the time provided.	Require the submission of a complete audit package within 5 working days.

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[1] At **Minor Level 3**, the EUB will require written confirmation within 5 working days of the immediate and continued shut-in of any noncompliant well until the EUB has confirmed in writing that compliance has been restored.
At **Minor Level 4,** the EUB will require the licensee to restore compliance by **segregating and shutting in** the noncompliant well. No operations will be permitted on site until the EUB gives written approval.

Major Enforcement[1] Ladder for Commingling Noncompliance

Noncompliance Item	Corrective Action
Commencement of and/or continued commingled production without approval.[2]	Require within 5 working days the submission of a (corrected) notification form or written confirmation of the immediate and continued shut-in of any noncompliant well until successful application under *Directive 065* has been made.
Failure to use the decision tree properly (i.e., submission of a notification form when a *Directive 065* application is required).	
Failure to resolve issues or to notify the EUB of unresolved issues, as per requirements/expectations.	
Failure to respond to written notification from the EUB of the need to address unclear situations in the time provided.	
Misrepresentation of data in the application or notification form.	
Commingled rate is greater than the combined threshold rate for low-productivity pools and the actual rate shown on the notification form for high-productivity pools.[3]	
Improper testing or calculation of rates.	Require written confirmation within 5 working days of the immediate and continued shut-in of any noncompliant well until the EUB has confirmed in writing that compliance has been restored.
Failure to meet conditions of approval.	

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[1] At **Major Level 3**, the EUB will require written confirmation within 5 working days of the immediate and continued shut-in of any noncompliant well until the EUB has confirmed in writing that compliance has been restored.
At **Major Level 4,** The EUB will require the licensee to restore compliance by **segregating and shutting in** the noncompliant well. No operations will be permitted on site until the EUB gives written approval.

[2] If a *Directive 065* application is required, the commingled pools must be included in the current MU order **prior to** the commencement of commingled production. If notification is suitable, a notification form must be submitted **within 30 days** of commencement of production.

[3] This enforcement ladder uses the definitions for threshold flow rates and low and high productivity pools as outlined in the Explanatory Notes for each of gas and oil production.

Appendix I

Enhanced Recovery (ER) Scheme Application Form

EUB Alberta Energy and Utilities Board

Resources

Enhanced Recovery (ER) Scheme

DAY	MONTH	YEAR

APPLICANT'S REFERENCE ____________________

The applicant certifies that the information provided here and in all supporting documentation is correct and in accordance with all regulatory requirements or as directed by the Alberta Energy and Utilities Board.

1 APPLICATION TYPE

1. Type of ER scheme being proposed or amended:
   - ☐ Waterflood
   - ☐ Immiscible gas/Solvent flood
   - ☐ Miscible flood
   - ☐ Gas cycling
   - ☐ Other

2. Is this application for a new ER scheme or an amendment to an existing ER scheme approval? New ☐ Amendment ☐

   If you select "New,"
   - *proceed to Section 2; do not answer questions 3 and 4;*
   - *attachments required: Isopach Map, Well Log(s), Pressure Data, and Interpretation.*

3. What is the existing EUB approval number proposed for amendment? ☐

4. Type of amendment:
   - ☐ Add injection well location(s)
   - ☐ Amend approval area
   - ☐ Amend approval conditions
   - ☐ Scheme termination

   If you select "Add injection well location(s)" only,
   - *you must respond to questions in Sections 2, 3, and 5. Do not respond to questions in Section 4.*

   If you select "Amend approval area" only,
   - *you must respond to questions in Sections 2, 4, and 5. Do not respond to questions in Section 3.*

   If you select "Add injection well location(s)" and "Amend approval area,"
   - *you must respond to questions in Section 2, 3, 4, and 5.*

   If you select "Amend approval conditions" only,
   - *you must respond to questions in Section 2 and 5. Do not respond to questions in Sections 3 and 4.*

   If you select "Scheme termination" only,
   - *you must respond to questions in Section 2 and 5. Do not respond to questions in Sections 3 and 4 or question 18 in Section 5.*

2 OWNERSHIP AND NOTIFICATION INFORMATION

5. The primary applicant must
   a) be the proposed approval holder for a new scheme or the current approval holder for an existing scheme, and
   b) represent all well licensees in the proposed approval area.

   Have these requirements been met? Yes ☐ No ☐

   If your answer is "No," you cannot submit this application.

6. An ER scheme application cannot be submitted until notification of all well licensees has been completed in accordance with *Directive 65*.

   Has notification been completed in accordance with *Directive 65*? Yes ☐ No ☐

   If your answer is "No," you cannot submit this application.

7. Are there outstanding concerns from well licensees? Yes ☐ No ☐

   If yes, the Licensee Concerns attachment must be submitted as part of the application, in accordance with *Directive 65*.

3 PROPOSED INJECTION WELL LOCATIONS AND INJECTION INTERVALS

8. An ER scheme application cannot be submitted unless the proposed injection wells have been drilled.

   Have the proposed injection wells been drilled? Yes ☐ No ☐

   If your answer is "No," you cannot submit this application.

9. An ER scheme application cannot be submitted unless the source of the proposed injection fluid has been secured.

   Has the source of the proposed injection fluid been secured? Yes ☐ No ☐

   If your answer is "No," you cannot submit this application.

10. Provide the following for the proposed injection well locations:

Well Licence Number	**Unique Well Identifier (UWI)**							**Injection Interval (TVD mKB)**		**Porosity Interval (TVD mKB)**		**Fluid Interface (TVD mKB) if applicable**	
	LE	LSD	SEC	TWP	RG	MER	ES	**Top**	**Base**	**Top**	**Base**	**Gas/Oil**	**Oil/Water**

11. What type of injection fluid, as identified by *Guide 51*, will be used?

☐ Class II – produced water (brine) without H_2S

☐ Class II – produced water (brine) with H_2S

☐ Class III – hydrocarbons or other gases without H_2S

☐ Class III – hydrocarbons or other gases with H_2S

☐ Class IV – non-saline water

If you select "Class II – produced water (brine) without H_2S" only,
- *do not respond to question 11a. Proceed to question 12.*

If you select "Class III – hydrocarbons or other gases without H_2S" only,
- *do not respond to question 11a, and*
- *proceed to question 12.*

If you select "Class IV – non-saline water,"
- *do not respond to question 11a, and*
- *proceed to question 12.*

11a. If an injection fluid contains H_2S and an emergency response plan (ERP) is required, the EUB must ensure that an up-to-date ERP is in place prior to its decision on the application.

Is an EUB-approved ERP incorporating the proposed scheme in place? Yes ☐ No ☐

If no, a discussion addressing the status of the ERP must be included in the Application attachment, in accordance with *Directive 65*.

12. Will injection commence in all proposed injection wells within three months of receipt of approval? Yes ☐ No ☐

If no, a discussion addressing the anticipated commencement of injection and the reason for the delay must be included in the Application attachment, in accordance with *Directive 65*.

4 PROPOSED APPROVAL AREA

13. Is the entire proposed approval area within the EUB's Pool Order boundary for the subject pool? Yes ☐ No ☐

If you select "No," you must respond to question 15.

14. Does your interpretation of pool extent correspond to the EUB's Pool Order boundary for the subject pool? Yes ☐ No ☐

If you select "No," you must respond to question 15.

15. Is the difference in pool delineation interpretation pertinent to the proposed ER scheme, in accordance with *Directive 65*? Yes ☐ No ☐

Provide a discussion of the difference in pool delineation and the pertinence to the proposed ER scheme in the Application attachment, in accordance with *Directive 65*.

5 SCHEME DETAILS

16. Is the scheme area currently administered under good production practice (GPP)? Yes ☐ No ☐

17. Will produced gas from the ER scheme area be conserved, in accordance with *Guide 60* requirements? Yes ☐ No ☐

18. What is the proposed voidage replacement ratio (VRR), on a monthly basis, for the scheme?

The EUB normally specifies a VRR of 1.0 to fully maintain reservoir pressure. If the VRR will not be 1.0, provide a technical justification in the Application attachment, in accordance with *Directive 65*.

19. Is or will any gas-cap gas be produced from the subject pool during the operation of the ER scheme? Yes ☐ No ☐

If yes, include a discussion on the potential for fluid migration into the gas cap in the Application attachment, in accordance with *Directive 65*.

If you select "No," do not respond to questions 20, 20a, 20b, or 20c.

20. Is gas-cap gas currently being produced from the scheme area? Yes ☐ No ☐

If you select "No," do not respond to questions 20a, 20b, or 20c.

20a. Has the appropriate concurrent production (CCP) approval been issued? Yes ☐ No ☐

If you select "Yes," do not respond to questions 20b or 20c.

20b. An application for CCP is required. Has an application for CCP been registered? Yes ☐ No ☐

If you select "No," do not respond to question 20c.

20c. If yes, provide the CCP application number.